

**The London School of Economics and Political Science**

*Sources of political, financial and social capital in  
Rural Colombia*

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## **Declaration**

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### **Statement of co-authored work**

I confirm that Chapter 2 was jointly co-authored with Jean Paul Faguet and Maria del Pilar Lopez-Urbe. I contributed 70% of this work.

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# Sources of political, financial and social capital in Rural Colombia

## Abstract

This thesis analyses dynamics of political, financial and social capital in rural contexts. It studies development outcomes through the analysis of the interrelations between the three sectors (state, market and civil society) and the institutions governing each. It builds on a territorial view of development, focusing on subnational analysis, and employs a pluralistic methodological approach, through the use of mixed methods. In the first paper, I analyse the relation between political institutions and distributive politics, in particular, the use of land as political capital. I study the case of Colombia during a process of institutional reform (consolidated in the drafting of a new constitution), which I characterize as a shift towards more inclusive institutions. This is defined as a shift towards a broader distribution of power (across political parties, branches of government, levels of government and societal actors) and towards a stronger and more effective state. Relying on panel data for over 1.100 municipalities during a 55-year period, I find evidence of a political land cycle: land allocations are systematically higher in electoral years relative to non-electoral ones. I show that this cycle is dependent on the political institutions in place, becoming smaller after the shift towards more inclusive institutions. The results point towards this being explained by incentive and capacity effects leading to a re-composition of distributive politics strategies from the allocation of targeted private benefits (like land) towards the strategic allocation of public goods.

In the second and third papers, I focus on financial capital, in particular, access to agricultural credit, and social capital, materialized in the form of Rural Producer Organizations (i.e. farmers' cooperatives and associations). I use novel data from Colombia to estimate logit, fixed-effects and differences-in-differences models. I find that RPOs increase access to agricultural credit at both the individual and local (municipality) level. The existence of positive general equilibrium effects implies that rather than there being crowding-out of credit (from RPO members to non-members), RPOs lead to aggregate increases in access to credit, constituting a tool for local financial development. I also show that the effects are heterogeneous: being positive for small farmers (through public credit) and for big farmers (through private credit), but not significant for medium ones. This appears to be the result of contextual conditions binding the effect of RPOs. In this case, the effect is conditioned by the structural segmentation of the credit market across sources and farmer type.

In the third paper, I rely on a mixed methods analysis to provide a more comprehensive picture of the relation between RPOs and access to credit. I analyse the demand and supply side mechanisms through which RPOs reduce credit constraints. The analysis is based on 60 semi-structured interviews to key informants (organized and non-organized farmers, credit analysts and policy experts) and on four case studies (four municipalities in Colombia). The cases were selected following a novel methodology combining nested analysis and stratified random sampling. I find that RPOs increase the supply of credit by increasing the likelihood of banks approving credit requests through signals of project and farmer quality that reduce problems of imperfect information. RPOs also increase the demand for credit, not only via investment demands for projects of increased profitability, but also as they reduce transaction costs (through the sharing of information) and constitute a safety net, reducing risk credit constraints.

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## **Introduction**

Rural development holds the key for some of the most pressing challenges the world faces today: lifting millions of people out of poverty and assuring food security amidst rapid population growth. The Food and Agriculture Organization of the United Nations estimates that economic growth from agriculture is 11 times more effective for poverty reduction than that of any other sector, and adds that this growth is the key for assuring that food production doubles before 2050, as needed in order to meet the demands of the growing population (FAO, 2015).

These challenges entail, among others, increasing farmers' access to financial capital that allows them to carry out profitable investments. Researchers estimate, for instance, that removing credit constraints in Peru would increase the value of agricultural output by 17% (Ayalew, Deininger and Duponchel, 2014) and in Colombia, it would double the agricultural income (Leibovich et al., 2013). Enhancing rural development also requires exploiting the benefits that social capital and collective action organizations offer for overcoming market and state failures present in rural areas. There is evidence, for instance, that when farmers organize in cooperatives, associations and other organizations which materialize and replicate social capital, they have better access to information, technology and input and output markets (Verhofstadt and Maertens, 2014; Conley and Udry, 2003; Bebbington, 1997; Narrod et al. 2009, Abebaw and Hail, 2013; Markussen and Tarp, 2014). Meeting the developmental challenges of rural areas requires as well improving the allocation of public resources, so that these are based on objective needs and welfare-maximization, constituting a source of inclusive growth rather than a source of political capital. The work of Diaz-Cayeros et al. (2016) shows for example, that the welfare effects of public goods, conditional cash transfers and other policy relief programs in Mexico improved as they became less clientelist and less discretionary.

This thesis builds on the above reflections, studying dynamics of financial, social and political capital in rural Colombia. The thesis builds on institutional pluralist approaches to development, recognizing that a thorough understanding of the causes of development requires studying the interdependent relations between the three sectors (market, state and civil society) and the institutions governing each (Brett, 2009). This thesis builds as well on a territorial view of development: in the three papers, the analysis is carried out at the subnational level. Focusing on within country units of analysis, and exploiting a large number of observations across space and time, allows to account for historical,

institutional and cultural factors at the micro level, providing analytical depth and robustness, and generating insights into the nature of developmental divergences within countries. The thesis relies on a pluralistic methodological approach. Through the use of mixed methods, I synergistically combine the statistical analysis of Large-N aggregate data to draw general relationships, together with qualitative Small-N analyses that provides in-depth and contextually-based inferences.

In the first paper, I focus on political capital. In particular, I analyse how political institutions affect distributive politics. The existing literature has focused mainly on the relation between democracy and distributive politics, studying for instance, the effect of regime type and of democratic maturity (Burgess et al., 2015; Brender and Drazen, 2005; Shi and Svensson, 2006; Akmedov and Zhuravskaya, 2004; Streb and Torrens, 2013). I contribute to this literature by going beyond the focus on democracy and analysing the relation between distributive politics and the broader concept of inclusive political institutions. Acemoglu and Robinson (2012, 2016) define inclusive political institutions as those in which there is, first, a broad distribution of political power; and second, a strong and effective state. I elaborate on this somewhat abstract concept, further characterizing it as institutions in which there is a broad distribution of power among: i) political parties (i.e. the existence of multiparty competition); ii) levels of government (i.e. having political decentralization); iii) branches of government (i.e. there being an effective division of power); and iv) societal actors in general (i.e. the existence of participatory democracy). Regarding the strength and effectiveness of the state, I focus on the state's fiscal and bureaucratic capacity to provide public goods. Building on this definition, I characterize as a shift towards more inclusive institutions, a structural institutional reform which took place in Colombia at the beginning of the 1990s, which was consolidated in the drafting of a new constitution.

I analyse how this shift affected distributive politics, in particular, the strategic allocation of land in relation with the electoral cycle. For this analysis, I rely on subnational panel data for over 1.100 municipalities over a 55-year period. I estimate a political land cycle (PLC) through a fixed effects Poisson regression<sup>1</sup>. Data on land allocations is reported at the monthly level, so the PLC is estimated based on electoral years (i.e. the 12-months prior to elections) rather than on calendar ones. As Labonne (2016) and Akmedov and Zhuravskaya (2004) show, high frequency data of this sort allows for a

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<sup>1</sup> As the outcome variable, the number of land allocations in a municipality  $i$  at year  $t$ , is a count variable and is censored at zero

cleaner identification of the political cycle. The timing of elections is fixed and pre-determined by law, being an exogenous variable. The shift towards more inclusive institutions is also exogenous to land dynamics, specific rural claims or dynamics in a particular municipality.

The results provide evidence of the use of land as a source of political capital. There is a political land cycle: land allocations are systematically higher in electoral years relative to non-electoral ones. Furthermore, this cycle is dependent on the political institutions in place: its magnitude is reduced by half after the shift towards more inclusive institutions. I further find that the reduction in the PLC is heterogeneous across space, being significantly stronger in “core” municipalities, that is, municipalities located in central areas, in which I show initial institutions were more inclusive and there was a stronger effective institutional shift. The results evidence that pre-existing institutions condition institutional change: where initial institutions were more inclusive, institutional change was enhanced, and where they were less inclusive, institutional change was blocked<sup>2</sup>. This paper also contributes to the literature on institutional change (Clark and Ghandi, 2015; Haber and Menaldo, 2011; Acemoglu, Johnson and Robinson, 2005), by providing micro-level empirical evidence on institutional heterogeneity and institutional divergence within a country.

I carry out further analyses to identify the specific mechanisms that explain why the PLC becomes smaller after the shift towards more inclusive institutions. The evidence points towards the reduction of the PLC being the result of a re-composition of distributive politics strategies: from the strategic allocation of private targeted benefits, to the strategic allocation of public goods. I show that while the PLC becomes smaller after the shift towards more inclusive institutions, the political cycle of spending on public goods becomes larger<sup>3</sup>.

While unbundling the specific relations explaining the effects of broad institutional changes is difficult (Kroth, Larcinese and Wehner, 2016), I focus on specific incentive and capacity effects through the separate analysis of changes in political competition,

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<sup>2</sup> Being a core municipality increases the likelihood of experiencing a strong response to the institutional shift, measured as above average increases in political competition and in spending on public goods. This evidences that although the institutional reform took place at the national level, the effective response to it was heterogeneous across space, what depended on the pre-existing institutional conditions.

<sup>3</sup> The study of Drazen and Eslava (2010) shows that in addition of strategic timing in public good expenditure, there is geographical targeting to swing municipalities, and that this strategy generates an electoral payoff.

political accountability and fiscal and bureaucratic capacity across municipalities. I argue that the re-composition of distributive politics is the result of both changes in incentives and changes in capacities of politicians to mobilize voters via the strategic allocation of different types of goods. Before the shift towards more inclusive institutions, when both political competition and state capacity were weak, it was efficient to mobilize small segments of voters relying on patronage networks and distributing targeted private benefits like vacant land, which is easy and cheap to allocate.

Once political competition increases (due to the introduction of multiparty elections) politicians have incentives to mobilize a broader and more heterogeneous set of voters, which is more effectively done through the strategic allocation of public goods. Diaz-Cayeros, Stévez and Magaloni (2016) argue that the broad appeal of public goods explains why increases in political competition lead to a diversification of electoral investments towards public goods in Mexico. This argument is consistent with evidence on Colombia showing that increases in political competition have a positive impact on public service provision (Sánchez and Pachón, 2013). More broadly, it is consistent with theories of democracy increasing public good provision and expenditure (Bueno de Mesquita et al. 2003; Min, 2015; Kroth, Larcinese and Wehner, 2016). Consistent with this argument, I show that the decrease in the PLC was stronger in municipalities in which political competition (measured as the Effective Number of Competing Parties<sup>4</sup>) increased the most after the institutional shift.

I posit that this incentive effect is re-enforced by increases in political responsiveness and accountability, which also derived from the institutional shift. In particular, the introduction of local elections, direct democracy mechanisms and the strengthening of executive constraints likely increased the accountability of politicians towards the demands of voters, who, as Faguet and Sánchez (2014) state, demanded improvements in public goods provision. In line with the above, I show that the reduction in the PLC was stronger in municipalities with higher levels of accountability<sup>5</sup>.

Finally, I state that the re-composition of distributive politics strategies towards public goods requires not only the incentives, but also the capacity to do so. This, as allocating public goods (e.g. a school) is more complex and expensive than allocating targeted

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<sup>4</sup> The ENCP is estimated for presidential elections, using data from the Base Electoral, CEDE.

<sup>5</sup> Measured as the Index of accountability and transparency (from the Open Government Index of Attorney General's office), which reflects the strength of the available mechanisms to strengthen state-citizen relations and to reduce corruption.

private benefits (e.g. a land title). The institutional shift led to a significant increase in fiscal and bureaucratic capacity: Intergovernmental transfers and total public investment increased (especially investment on public goods), and training and technical support programs for local governments were strengthened (DNP, 2002). I show that in line with the above, the reduction in the PLC was stronger in municipalities in which the efficiency of public good provision was higher.

Overall, these results evidence how the politically motivated allocation of resources depends on the political institutions in place. They also show how, by adapting to institutional conditions, distributive politics can persist even in democratic settings, being more pervasive than what expected based on the “mature democracy” argument (Brender and Drazen, 2003) or on traditional modernization theories (discussed in Kitschelt and Wilkinson, 2007). Furthermore, the results evidence the territorial dimension of distributive politics: the politically motivated allocation of resources is heterogeneous even within countries, as contextual conditions, and in particular, institutional conditions, vary across the territory. This implies that the potential solutions to distributive politics should be tailored to local contexts and to institutional differences at the micro level.

In the second and third papers, I focus on two other types of capital: financial capital and social capital. During the past three decades, the role of social relations and social organizations has become central in the study of development. To describe these, academics have proposed concepts including social capital and collective action, which although difficult to define<sup>6</sup>, ultimately refer to how social relations enable cooperation and the pursuit of common objectives, allowing individuals to achieve outcomes difficult to achieve if they were acting on their own, or if the market or the state were acting on their own (Ostrom, 1990, Bowles and Gintis, 2002; Putnam, 1993; Bourdieu, 1986; Coleman, 1988).

I focus on a key and common form of social capital in rural areas: Rural Producer Organizations (RPOs). These include agricultural cooperatives, associations and similar organizations through which farmers voluntarily invest effort and resources to pursue

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<sup>6</sup> Putnam (1993) defines social capital as the interrelationships that enable people to coordinate action to achieve desired goals, and argues that membership in social organizations is a form of social capital. There is an ongoing debate on what constitutes a good definition of social capital, on how to adequately measure it (Serra, 2011; Portes, 1998). There are also various definitions of collective action, with commonalities in that they refer to the involvement of a group of people, shared interests, and voluntary action to pursue those shared interests (Meinzen-Dick et al. 2004).

common productive and commercialization objectives. Social organizations of this sort reflect and replicate social capital (Putnam, 1993). Different studies provide evidence on how RPOs increase access to input and output markets (Verhofstadt and Maertens, 2014; Conley and Udry, 2003; Bebbington, 1997; Narrod et al. 2009). I contribute to this body of literature showing that RPOs also increase access to financial capital, in particular, to agricultural credit. Identifying alternative ways of increasing access to financial capital is a key challenge of rural development, as despite its well-known positive impact on production, productivity and poverty (Ayalew, Deininger and Duponchel 2014; Conning and Udry, 2007; Burgess and Pande, 2005), it remains limited throughout the developing world (Guirkingner and Boucher, 2008),

I quantitatively explore the relation between RPOs and access to agricultural credit in the second paper (co-authored with Jean Paul Faguet and Maria Lopez-Urbe). The relation is analysed at both the individual and municipality level. The individual level analysis relies on census data for over 2,3 million producers and estimates a Logit model. The municipality level analysis relies on novel panel data for over 15.000 municipality-year observations on credit allocations and RPO creations. Both fixed effects and difference-in-differences models are estimated. The fixed effects model includes municipality, year and department-year fixed effects, as well as municipality and time varying controls. The differences-in-differences estimation is based on multiple treatment and control groups.

The results show that RPO membership increases the likelihood of an individual accessing agricultural credit. This, however, does not imply that there are positive general equilibrium effects, as collective action could increase access for just some (i.e. organized farmers) while crowding-out resources available for other (i.e. non-organized farmers). As such, the developmental impact on financial access is unclear. The municipality level analysis focuses on this, evidencing that this form of collective action does constitute a tool for local financial development, as it does lead to aggregate increases on access to credit. The positive general equilibrium effects point towards the existence of spillover effects (from RPO members to non-members), at least when credit supply is not fixed.

In addition to providing evidence on the positive general equilibrium effects, we show that the effect of collective action is heterogeneous. We analyse differential effects for credit granted to big, medium and small farmers, by both public and private banks. The results show that collective action increases access to credit for small farmers, but only through public credit. It also increases access to credit for big farmers, but only through private credit; in contrast, the effect is not significant for medium-scale farmers. We posit

that the heterogeneous effect of collective action is explained by binding contextual conditions. In this case, the binding condition is the structural segmentation of the credit market: private banks favour large credits, as fixed transaction costs and risk are perceived as lower. In turn, public banks favour credit for small farmers, as they have a dual mission of allocating financial resources and of promoting rural development (i.e. through serving vulnerable population). Under these conditions, medium-scale farmers are left in-between, financially underserved. The results of this paper evidence that collective action replicates, rather than counteracts the structural segmentation of the credit market. This distributional analysis constitutes another contribution, in particular to the literature on rural financial development (Guirking and Boucher, 2008; Ayalew, Deininger and Duponchel, 2014; Carter and Olinto, 2003; Conning and Udry, 2005), which, as Banerjee et al. (2015) highlight, has seldom explored heterogeneous effects. This type of analysis is particularly relevant when studying highly fragmented markets such as the credit market, and is crucial for identifying strategies that allow a transit towards inclusive financial systems (United Nations, 2006).

In the third paper, I build on the aforementioned econometric results, and through a mixed methods analysis, I provide a more comprehensive picture of the relation between RPOs and access to credit. In particular, I identify the demand and supply side mechanisms through which RPOs reduce credit constraints. To this end, I carry out a Small-N qualitative analysis consisting of four case studies (four municipalities) and over 60 semi-structured interviews to organized and unorganized farmers, local banks and policy actors. For the case selection, I propose a methodology combining Lieberman's (2005) approach for nested analysis with Fearon and Laitin's (2008) stratified random case selection. The procedure is based on the main econometric model<sup>7</sup> of paper two, from which I estimate residuals and categorize municipalities based on deciles of these. I then semi-randomly<sup>8</sup> select the cases: two from the decile of lowest residuals (i.e. on-the-regression-line cases) and two from the decile of highest residuals (i.e. off-the-regression-line cases). I carry out differences-in-means tests for a large set of socioeconomic characteristics in order to discard the existence of systematic or extreme differences between the selected cases and the average municipality. I then carry out within and

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<sup>7</sup> The Fixed Effects model estimating the relation between RPOs in a municipality and the total number of credits allocated.

<sup>8</sup> I randomly order the municipalities and select the first to comply with a set of criteria following purposive sampling, for instance, that security conditions were not a threat, and that there were enough RPOs to interview.

across-case comparisons in order to identify common mechanisms, as well as reasons that explain the low fit of the econometric model in the off-the-line cases.

The results indicate that collective action in the form of RPOs reduces credit constraints from both the demand and supply side. I classify the mechanisms according to whether they loosen price, quantity, transaction cost or risk credit constraints, following the categorization proposed in the literature (Guirkinger and Boucher, 2008). I find that RPOs loosen quantity credit constraints (i.e. constraints stemming from the supply of credit being lower than its effective demand). This occurs as RPOs grant credit to their members, and as RPO members are able to access associative credit lines offered by banks directly to organizations and under preferential conditions. Furthermore, collective action increases the likelihood of banks approving individual credit requests. This, as RPO membership increases the creditworthiness of farmers through signals of project quality and farmer quality (i.e. screening of applicants), lessening problems of imperfect and asymmetric information. In addition to this, banks are able to reduce operational costs by offering and approving credits to RPO members in a block.

I also find that this form of collective action increases the demand for credit, as through RPOs, farmers are able to engage in new, larger and more profitable projects which require investment. The profitability of projects increases as these organizations enable farmers to access inputs at lower prices (buying at scale), and ease access to markets (through joint direct commercialization). It also eases access to technical assistance and to other forms of government support. In addition to the above, I find that collective action reduces transaction cost constraints, further increasing the demand for credit. This occurs through the sharing of information on credit opportunities and the application process (i.e. RPOs are information hubs). Finally, RPOs reduce risk credit constraints, as they constitute a safety net, among others, providing emergency informal loans which can be used to meet formal credit obligations in cases of low liquidity.

These mechanisms were found to be stronger in the on-the-regression-line cases, while they were weaker in the off-the-line ones<sup>9</sup>. The evidence points towards this being the result of the general weakness of RPOs in the off-the-line municipalities, which in turn, results from the way in which RPOs emerge. I find that in the on-the-line municipalities,

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<sup>9</sup> Off-the-line cases are those in which the model residuals are high, meaning that RPO dynamics do not explain credit dynamics as predicted. In the paper, I further discuss their nature and some systematic characteristics that can explain the low fit of the model: a larger number of RPO creation shocks, a lower dependence on the agricultural sector and low levels of land informality.



RPOs tend to emerge organically, as a bottom-up initiatives seeking collective, productive and long-term benefits. In contrast, in the off-the-line cases, RPOs tend to be created non-organically, as a result of top down external stimulus offering short term benefits (e.g. receiving resources from a specific public program which requires beneficiaries to be organized). Under these circumstances, RPOs are constituted without clear or common objectives and collective action rules, becoming weak organizations which offer limited benefits to their members, including those which can reduce credit constraints.

The results evidence that the potential benefits of RPOs go beyond easing access to markets and technology; they also increase access to financial capital. This constitutes a contribution to the literature on collective action rural organizations (Desai and Joshi, 2014; Vandeplas et al. 2013; Abebaw and Hail, 2013; Markussen and Tarp, 2014; Bebbington, 1997). The paper also contributes though the analysis of the heterogeneity in the nature of RPOs, and by providing evidence on how environments, incentives and rules affect the structure, functioning and potential impact of collective action organizations. Through this analysis, I link the literature on collective action with the literature on sociological organizational theory (Hannan and Freeman; 1977; Scott and Meyer; 1991; McPherson and Rotolo, 1996; Andrews, et al. 2010).

In addition to the aforementioned thematic contributions of each paper, this thesis contributes as a whole in methodological terms. First, by evidencing the value of synergistically integrating quantitative and qualitative methods for gaining analytical leverage. As Gerring (2005) mentions, good social science research should focus not only on predicting a particular relation between two variables, but also on explaining why, how and when those variables are related. Through the use of mixed methods, I was able to: i) identify the mechanisms explaining the relation between the dependent and independent variables; ii) gain more confidence on the Large-N Analysis (what Lieberman (2005) terms Model-testing LNA); iii) improve the quality of theoretical conceptualizations (e.g. on how collective action materializes heterogeneously in Rural Producer Organizations and how the segmentation of the credit market operates); and iv) carry out the case selection in a more structured way. The proposed step-to-step methodology for case selection exploits the richness of quantitative data to rule out the existence of systematic differences between case alternatives, lessening threats of selection bias. Having a step-to-step case selection methodology is particularly relevant for studies with a large number of potential cases is large, as in subnational analyses (in

this case, there were 1.100 potential cases). Furthermore, the proposed nested analysis approach evidences that Small-N Analyses profit from relying on both on-the-line cases (to carry out further analysis, in particular, to identify underlying mechanisms) and on off-the-line cases (to structurally search for heterogeneity which can explain the low fit of the LNA).

Under a research design perspective, this thesis also contributes by evidencing the value of carrying out “one-country, Large-N” analyses (Faguet, 2012; Kroth, Larcinese and Wehner, 2016). The use of subnational data over long periods of time allows to control for historical, institutional and cultural factors that typically bedevil inferences made on small samples and on a fixed moment in time. Furthermore, as Arias (2015) notes, country-level studies focusing on specific institutions throughout time and space can provide analytical richness and context-specificity that allow for a better understanding of the mechanisms of causality between institutions and development outcomes.

Finally, this paper contributes to the policy agenda of Colombia, in which rural development in this country constitutes a first order challenge. This, not only for reducing poverty levels (currently of 40% in rural areas) and for assuring food security to its population, but also for advancing the peace building agenda (set after the signing of a peace agreement with guerrilla group Las Farc in 2016). This agenda aims at tackling the structural conditions which contributed to the onset of an armed conflict of over 50 years, of which rural poverty and inequality (especially land inequality) are central ones (Comisión Histórica del Conflicto y sus Víctimas, 2015).

Addressing the “historic debt with rural areas” (as several academic and policy leaders refer to), entails improving the distribution of land. This requires allocating land following objective and welfare maximizing considerations, rather than using it as a source of political capital. Addressing this historic debt also requires generating a double inclusion (productive and social) (Ocampo and Gómez, 2015), through increases in the productivity of agriculture, which remains substantially lower than the Latin American average (0,2% vs 1,9%) (Arguello, Torres and Quintero, 2014). One of the main ways to enhance productivity growth is to increase access to financial capital (currently, only 11% of farmers access credit in a given year, Agrarian Census, 2013). Political and market approaches alone will not suffice to assure rural development. This also requires the engagement of the third sector, civil society, as an active actor in development. Social capital and organizations such as RPOs have the potential not only of increasing access

to input, output and financial markets, but also to rebuild social cohesion and empower local communities.

These rural development challenges are not particular to Colombia. Countries throughout the developing world require improving the efficiency of resource allocations such as land, so that they constitute productive assets rather than political capital. They also require novel strategies for increasing access to financial capital which allows farmers to carry out profit maximizing investments, and they require as well unleashing the potential of social capital and collective action organizations to ease access to markets and to strengthen social cohesion. Thorough answers to these developmental challenges require inputs from research analysing the complex interrelations across the market, state and civil society sectors, and of the institutions governing each. This is better achieved through methodological approaches that integrate quantitative and qualitative data, and that focus on the territorial dimension of development.

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## Chapter 1

# From Targeted Private Benefits to Public Goods: Land, Patronage and Political Institutions in Colombia

### Abstract

*This paper analyses how changes in political institutions affect distributive politics. It studies the case of Colombia during a period of reform in which the distribution of political power was broadened across political actors, levels of government and branches of government, and in which the effectiveness of the State increased through fiscal and administrative reforms. I rely on over 55.000 municipality-year observations to analyse the relation between the electoral cycle and the targeting of private benefits, in particular, land. I find evidence of a political land cycle (PLC) and of it being dependent on the political institutions in place: after the institutional shift, the magnitude of the PLC was reduced by half. This reduction was heterogeneous across space, being stronger in municipalities in which initial institutions were more inclusive (enhancing, rather than blocking institutional change). I explore the mechanisms explaining the reduction in the PLC and find evidence pointing towards it being the result of a re-composition of distributive politics: from targeted private benefits, towards the strategic allocation of public goods. The results show that while the PLC became smaller after the institutional shift, the political cycle of spending on public goods significantly increased. This re-composition likely results from joint incentive and capacity effects. I argue that increases in political competition and political accountability increased the incentives to mobilize voters via the strategic allocation of public goods which can appeal to a broader and more heterogeneous set of voters. Furthermore, the shift significantly increased fiscal and bureaucratic capacity to provide public goods, giving politicians the required capacity to re-compose their voter mobilization strategies. Consistent with the argument, I find that the reduction in the PLC was significantly stronger in municipalities in which political competition increased the most and in which political accountability and efficiency in public good provision were highest. Overall, the results show that distributive politics strategies transform, rather than disappear with improvements in institutional quality.*

**Key words:** Distributive politics, electoral cycles, institutions, political institutions, land reform, targeted benefits, public goods, Colombia.

**JEL:** D72, D73, H410, H420, L33, Q15

### 1.1 Introduction

The allocation of public resources is often affected by electoral interests, which can deviate these from optimal targeting based on objective needs or rights. The literature on distributive politics shows, for instance, that allocations of public resources can be strategically targeted towards certain groups of people or localities, following ideological, partisan or ethnic considerations (for a review see Golden and Min, 2013). There is also



evidence that allocations can be strategically timed, generating political budget and business cycles (for reviews see Dubois, 2016; Mandon and Cassals, 2018).

Some studies analyse how contextual conditions, and in particular, political institutions, affect distributive politics. This strand of the literature has focused especially on the issue of democracy. The work of Burgess et al. (2015) shows for instance, that the strategic allocation of road expenditure in Kenya is dependent on regime type: periods of autocracy saw co-ethnic favouritism, while the effect disappeared during democratic ones. Other studies analyse the effect of democratic maturity, finding that political budget cycles are less prevalent in mature democracies, arguably as voters become more informed and experienced, punishing the electoral manipulation of resources (Brender and Drazen, 2005). There is also evidence that government transparency, media freedom, and in general, checks and balances associated with stronger democracies, reduce the capacity of politicians to manipulate resources (Shi and Svensson, 2006; Akmedov and Zhuravskaya, 2004; Streb and Torrens, 2013)<sup>10</sup>.

This paper goes beyond the traditional focus on democracy by analysing the relation between distributive politics and the broader concept of inclusive political institutions. Institutions refer to the rules, norms and customs (or more broadly, the “rules of the game”) which structure human interaction (North, 1990; Levi and Menaldo, 2015). The work of Acemoglu, Johnson and Robinson (2001, 2005) and Acemoglu and Robinson (2012, 2016) focuses on the role of political institutions, in particular, on how institutions that are more “inclusive” are more conducive to development. Their work emphasizes on two aspects of institutions that make them more or less inclusive: first, having a broad distribution of power, and second, a state with capacity.

Other authors refer to similar concepts for depicting systems in which political relations are more progressive, pluralistic and democratic. For instance, North, Wallis and Weingast (2009) refer to “open access orders”. Overall, broad concepts such as these are difficult to define axiomatically (Boldrin, Levine and Modica, 2012). To address this, I further elaborate on the concept of “inclusive”, explicitly defining the dimensions according to which political institutions are considered more or less inclusive. I characterize inclusive political institutions as those in which there is a broad distribution

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<sup>10</sup> Other studies have focused on variations of political institutions within democracies. For example, Persson and Tabellini (2003) analyse differences in political budget cycles in countries with different electoral rules (proportional representation vs. majoritarian) and between government systems (parliamentary vs. presidential).

of power among: i) political parties (i.e. the existence of multiparty competition); ii) levels of government (i.e. having political decentralization); iii) branches of government (i.e. there being an effective division of power); and iv) societal actors in general (i.e. the existence of participatory democracy); and in which the state has fiscal and bureaucratic capacity to provide public goods<sup>11</sup>.

Based on the above, I characterize an institutional reform which took place at the beginning of the 1990s in Colombia, when the drafting of a new constitution consolidated a process of political reform which opened the political system and strengthened the state<sup>12</sup>, marking a shift towards more inclusive political institutions. I analyse the effect of this institutional shift on the nature of distributive politics. In particular, on the strategic allocation of land in relation with the electoral cycle. The analysis relies on subnational data for over 1.100 municipalities between 1960 and 2014. For the analysis, the timing of elections is exogenous, as it is fixed and pre-determined by law. As will be further discussed, the timing of the institutional reform is also exogenous to land reform dynamics and to particular municipality traits.

I find evidence of a political land cycle (PLC): the number of land allocations is systematically higher in electoral years relative to non-electoral ones. I further find that the PLC is dependent on the political institutions in place: its magnitude is reduced by half after the shift towards more inclusive institutions. Moreover, the reduction in the PLC is heterogeneous across space, being significantly larger in “core” municipalities, that is, municipalities located in central areas, in which initial institutions were more inclusive. I show that in these municipalities, initial institutional conditions enhanced, rather than limited effective institutional change. This result is consistent with previous studies showing that institutional change depends on the pre-existing institutional context (Clark and Ghandi, 2015; Haber and Menaldo, 2011; Acemoglu, Johnson and Robinson, 2005; Heybey and Murrel, 1999).

I analyse the underlying mechanisms that explain the post shift reduction in the PLC. The evidence points towards this being the result of a re-composition of distributive politics, from targeted private benefits (in this case, land) towards the strategic allocation of public

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<sup>11</sup> In this analysis I do not address other dimensions of state capacity, such as having the monopoly of violence or enforcing laws.

<sup>12</sup> As will be further discussed, the institutional reform did not specifically change land allocation rules. Furthermore, the reform was exogenous to particular municipality characteristics and to land specific dynamics. In this sense, it was exogenous.

goods. I show that while the post shift period saw a decrease in the PLC, there was an increase in the political cycle of spending on public goods<sup>13</sup>. I argue that this re-composition of distributive politics away from particularistic goods and towards public goods, results from both incentive and capacity effects. The incentive effect derives from increases in political competition brought along by the introduction of multiparty competition. While one could expect political competition to overall increase distributive politics (i.e. elections become more threatening, increasing the need to mobilize voters via distributive politics), the effect most likely depends on the type of resource to be allocated. In particular, I argue that political competition weakens the incentives to mobilize voters via targeted private benefits (like land), which can only be allocated to a restricted group of voters; and in contrast, it strengthens the incentives to mobilize voters via strategic allocations of public goods, which appeal to a broader and more heterogeneous set of voters. This goes in line with the findings of Diaz-Cayeros, Stévez and Magaloni (2016) showing that political competition in Mexico lead to a “diversification of electoral investments” towards public goods. Consistent with the above, I show that the reduction in the PLC was significantly stronger in municipalities in which political competition<sup>14</sup> increased the most.

The incentives to mobilize voters via different types of resources should not only depend on political competition, but also on how responsive and accountable politicians are to the demands of voters, and on what these demands are. In the Colombian case, there is evidence that the institutional shift increased responsiveness and accountability of politicians to voter demands, which mainly consisted of improvements in public goods provision (Faguet and Sánchez, 2014). This occurred not only through the introduction of local elections, but also through the introduction of participatory democracy and the strengthening of executive constraints, which further increased political responsiveness and accountability. Consistent with the above, I show that the reduction in the PLC was stronger in municipalities in which the levels of accountability and transparency were higher<sup>15</sup>; that is, those in which the incentives to respond to voter demands to allocate public goods, were stronger.

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<sup>13</sup> Implies that spending on public goods is not determined by fully programmatic (i.e. non-discretionary and universal) criteria, but also by political ones.

<sup>14</sup> Measured as the Effective Number of Competing Parties (ENCP)

<sup>15</sup> I measure this through the index of accountability and transparency (from the Open Government Index of Attorney General’s office), which reflects the strength of the available mechanisms to strengthen state-citizen relations and to reduce corruption

I argue that the re-composition of distributive politics towards public goods requires not only the incentives, but also the capacity (fiscal and bureaucratic) to do so. Public goods are more expensive and complex to provide than targeted private ones (e.g. building a hospital or school is more expensive and complex than signing a land title certificate). In the Colombian case, the institutional reform significantly increased fiscal resources (especially for public goods investments) as well as bureaucratic capacity (through training and technical assistance programs) (DNP, 2002). In line with the argument, I show that the decrease in the PLC was stronger in the municipalities which had a higher efficiency in public good provision<sup>16</sup>.

The results in this paper are robust to alternative estimation strategies and model specifications, including different distributional assumptions, including time trends, additional controls and excluding outliers. Furthermore, I discard alternative explanations for the reduction in the PLC. I show that the reduction is not explained by increases in land dispossession associated to the escalation of the armed conflict (which could reduce the demand for land and the return of land patronage), or by negative economic shocks associated with the process of economic liberalization. I also discard the reduction being the result of resource exhaustion or of modifications in the land reform law.

This paper contributes to the literature in several ways. First, it links the literature on distributive politics with that on institutions and development, showing that political cycles are dependent on how inclusive political institutions are. While previous studies show that political business and budget cycles are highly context dependent (Eibl and Lynde-Mangueira, 2017; Klomp and de Haan, 2013), most of these studies analyse cross-country differences such as regime type or democratic maturity (Brender and Drazen, 2003; Shi and Svensson, 2006; Mandon and Cazals, 2018), while fewer focus on within-country variations in political institutions (Akmedov and Zhuavskaya, 2004; González, 2002; Labonne, 2016). I further show that electoral cycles are conditional on local political institutions. Subnational analysis of distributive politics, such as the one carried out in this paper, generate stronger and deeper causal inferences, allowing to control for cultural, historical and macro institutional traits that complicate causal inference in cross country studies.

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<sup>16</sup> The efficiency measure comes from the Integral Performance Index of the National Planning Department (DNP), and refers to the provision of a maximum level of output (in health, education and public services) given a level of input.

Another contribution to the literature on distributive politics is specifying the incentive and capacity mechanisms that explain the transformation of voter mobilization strategies. As highlighted by Kroth, Larcinese and Wehner (2016), studies focusing only on changes in regime type (e.g. using dichotomous measures or composite indexes of democracy) are usually unable to identify the specific dimensions that account for the effects of interest. By analysing subnational level variations in political competition, accountability and fiscal and bureaucratic capacity, I am able to disentangle some of the mechanisms explaining the changes in distributive politics strategies. The results in this paper evidence the resilience of distributive politics, suggesting it is a more persistent practice than what expected based on the mature democracy (Brender and Drazen, 2003) or traditional modernization theories (Kitschelt and Wilkinson, 2007). The results are rather consistent with qualitative studies from the literature on clientelism, showing this can be an enduring feature of politics, persisting even in modern and democratic settings (Roniger, 2004).

Another contribution of the paper is showing that the nature of distributive politics depends on the resource's traits. While previous studies document how distributive politics strategies depend on contextual conditions; fewer focus on how particular characteristics of a resource shape them (Diaz-Cayeros, Estévez and Magaloni, 2016; Albertus 2013). I develop an analytical framework based on three analytical categories (allocation type, costs and value) for analysing how a resource's traits condition its political use. Relying on this framework, I characterize land as a patronage<sup>17</sup> resource. In doing so, I contribute to the emerging literature on the political economy of land reform (Albertus et al, 2016; Albertus, 2015; Boone, 2009, 2010; Bardhan and Mookherjee, 2010, Kopas, 2018).

Finally, the paper contributes to the literature on institutional change (Clark and Ghandi, 2015; Haber and Menaldo, 2011; Acemoglu, Johnson and Robinson, 2005; Heybey and Murrel, 1999), by providing micro-level empirical evidence on how aggregate institutional changes spread across space conditioned by heterogeneity in pre-existing institutions, what leads to institutional divergence even within countries.

The remaining of this article is structured as follows: the next section discusses the distributive politics of land. I then describe the setting, in particular, the Colombian land reform program and the nature of the institutional reform. The fourth section details the

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<sup>17</sup> Defined following Stokes (2009), as the proffering of public resources while in office, in exchange for electoral support

methodological approach and the fifth section discusses the results. Section six presents the robustness tests, and section seven examines alternative explanations. The last section concludes.

## **1.2 The distributive politics of land**

Access to land (and thus, land reform) is key for rural development: it has a positive impact on income (Keswell & Carter, 2014), productivity (Banerjee, Gertler and Ghatak, 2002) intergenerational mobility (Galán, 2018), poverty (Besley and Burgess, 2000; Faguet, Sánchez and Villaveces, 2018) and inequality (Besley, Leight, Pande, and Rao, 2013). In addition to being a valuable resource in an economic sense, land also has a social value. Thiesenhusen (1995) states for instance, that access to land grants status and builds peasant identity. This paper focuses on another value of land: its political value.

Before discussing the empirical evidence on the use of land as a political asset, it is worth reflecting on the specific characteristics of land, and how these determine the potential cost and benefits of using it a patronage resource. The literature on distributive politics has analysed how contextual characteristics condition the political usage of a resource, but has given less attention to how the specific traits of a resource condition it. Albertus (2013) analyses, for instance, differences based on how reversible a transfer is and on the potential long-term benefits it can generate to the recipient. Drazen and Eslava (2010) study differences in how visible a resource is.

Despite the above, there has not been a systematic analysis of how a resource's traits determine the cost and benefits of its political usage. To this end I elaborate a conceptual framework based on analytical categories (allocation type, costs and value), which synthesizes discussions from the distributive politics literature, and adds to them. This framework can be used to characterize any type of patronage resource. In Table 1.1, I characterize land.

**Table 1.1 Land as a patronage resource**

<b>Allocation type</b>	<p><b>Type of good:</b> Private - particularistic. Land is a rivalrous and excludable good, granted to a particular individual (rather than to a certain group of individuals or geographic constituency).</p> <p><b>Visibility:</b> Low. The allocation is only visible to the individual recipient. As a result, voting <i>spillovers</i> are potentially low (relative to for example, the allocation of a school, which is visible to the whole community).</p> <p><b>Discretionality:</b> High. Rules of who is subject of receiving land are usually discretionary. When there are formal allocating criteria (e.g. being landless), these are set subjectively, and can be by-passed by bureaucrats or politicians.</p> <p><b>Constraints:</b> Medium. There are no formal constraints on land allocations, in contrast to for instance, fiscal rules constraining public spending. However, there is a physical constraint: the geographical stock of land.</p> <p><b>Durability:</b> Permanent. A land title does not run out, in contrast to for example, a cash transfer or credit allocation.</p> <p><b>Reversibility:</b> Non-reversible (in contexts of secure property rights), in contrast to for example, a job.</p> <p><b>Signal potential:</b> Unclear. The competence signal (Rogoff, 1990) of allocating land is weaker than that of more complex allocations (e.g. building a road). The preference signal (Drazen and Eslava, 2010) is not clear, as allocating land could signal right wing preferences (e.g. granting property rights) or left wing ones (e.g. redistribution).</p>
<b>Cost</b>	<p><b>Fiscal:</b> Low for distributive land reform (i.e. allocating public vacant land). Redistributive land reforms which do not require buying land but rather expropriating it, also have a low fiscal cost. Note that because of the small impact on budget deficit, the punishment from fiscal conservative voters (Brender and Drazen, 2005) should be low. The administrative process can entail a fiscal cost, albeit low.</p> <p><b>Economic:</b> Low. Distributive land reform should not entail economic costs, as land is to be used for productive purposes. As such, there is no disruption of production, as in the case of redistributive land reforms, in which there can be a reduction in production or productivity from relocating land from large landholdings in favour of small ones (Albertus et al. 2016).</p> <p><b>Political:</b> Low. Distributive land reform does not entail politically costly measures such as expropriation.</p>

<p><b>Value</b></p>	<p><b>Economic:</b> High. Land is the main productive asset for agriculture, increasing productivity and income (Keswell and Carter, 2014; Banerjee, Gertler and Ghatak, 2002). Moreover, its value tends to appreciate over time.</p> <p><b>Social:</b> High. Access to land entails a payoff in terms of peasant identity and peasant mobilization (Thiesenhusen, 1995)</p> <p><b>Political (for the politician):</b> Potentially high</p> <ul style="list-style-type: none"> <li>- <b>Turnout:</b> Possible increase. Accessing property rights increases turnout through a “symbolic effect” of rights recognition that legitimizes claim-making and engagement in politics (conditional on weak presence of state) (Kopas, 2018).</li> <li>- <b>Ideological position shift:</b> Possible. There is evidence of voter shift to the right in Mexican land beneficiaries (De Janvry et al. 2014), as access to property right is associated with pro-market behaviour.</li> <li>- <b>Reciprocity:</b> Unclear. Land allocations are a one-off permanent transfer which can lead to a credible commitment problem (the voter not voting for the party in future elections). However, given the high value it generates for the recipient, and its durability, land could generate a strong and lasting commitment. Moreover, reciprocity can be achieved and sustained through provisions of complementary services (like credit, Albertus et al. 2016), or through a “credible punishment” strategy, in which there is a threat of taking land away.</li> </ul>
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The above characterization evidences the attractiveness of land as a patronage resource: it is highly valued by voters and it has a low allocation cost (it is easy to target and to distribute). However, land allocations face physical limits, and a credible commitment problem. Given these opposing traits, it is not obvious whether land allocations can be used or not for distributive politics.

Previous studies show, however, that land is granted following political interests. For instance, Bardhan and Mookherjee (2010) show that land allocations in West Bengal are affected by the electoral cycle; and Albertus, Magaloni, Weingast and Diaz-Cayeros (2016) show the analogous for the case of Mexico. Other studies provide evidence on the strategic allocation of land based on partisanship. Albertus (2015a and 2015b) shows that land was strategically allocated to core supporters during military autocracies in Venezuela and Chile. There is also evidence of land being used for rewarding Magube's supporters in Zimbabwe (Boone and Kriger, 2010) and of land being used for patronage in Kenya, Cote d'Ivoire and the Democratic Republic of Congo (Boone, 2009; Boone, 2011). I now discuss the relation between land and politics in the Colombian case.

### **1.3 Setting**

#### **1.3.1 Land and politics in Colombia**

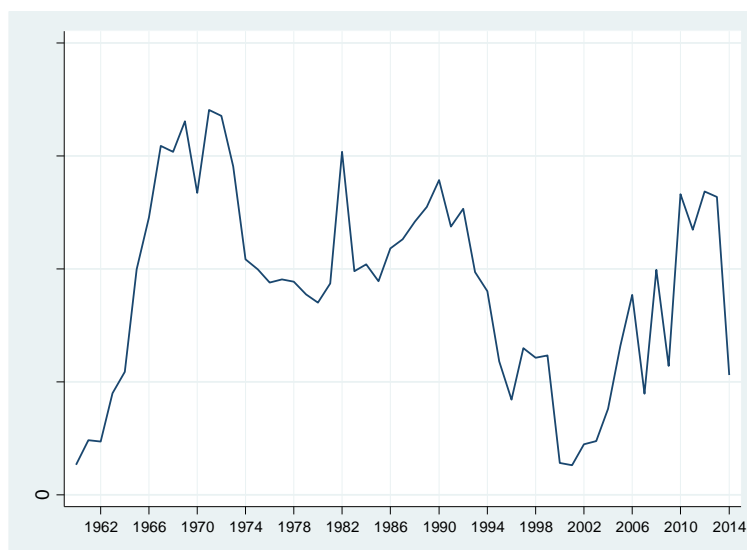
Land reform in Colombia has mainly consisted of public land distribution. During the last century, the national government allocated over 23 million Hectares of public vacant lands (*baldíos*) to farmers<sup>18</sup>, what represents almost 40% of the country's productive land. The allocations aimed at expanding the agricultural frontier and at reducing poverty as well as social tensions resulting from land grievances. This paper analyses another relevant, yet understudied, purpose of land reform: cultivating political support.

Figure 1.1 shows the dynamics of land allocations throughout the study period (1960-2014), evidencing a high variance throughout time, and a coincidence of allocation peaks and electoral years (marked on the x-axis).

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<sup>18</sup> Redistributive land reform has been marginal, as elites have been able to block initiatives posing threats to the existent land tenure (Le Grand, 1988; Zamosc, 1986; Machado, 2012; Albertus and Kaplan, 2012).

**Figure 1.1 Number of land allocations across time**



Source: Incoder.

Variations in land allocations come from both the demand and supply sides. The program is in principle demand-driven: a person goes to the regional office of the land agency<sup>19</sup> to request the formal allocation (i.e. the land title, which is a one-off permanent transfer) of a plot of public vacant land. The supply effect comes from the agency having discretionary power to determine whether or not to allocate the requested land. This decision is taken by a regional committee with representatives from the land agency and from peasant organizations in the country, and is then validated by the national office of the land agency (Albertus, 2019). In theory, this decision should be made according to fixed and public rules established in the land reform law; in practice, political considerations can relegate these distributional rules. For example, in an effort to make allocation criteria stricter, Law 160 of 1994 determined that land could only be granted to poor landless peasants, and established a maximum size of land to be allocated in each area of the country. However, a recent study showed these criteria are often not met, partly due to a lack of technical capacity and partly due to a lack of political will (Proyectamos Colombia, 2015). Deininger (1999) states that the selection of beneficiaries of the Colombian land program has often been arbitrary and ad hoc, *de facto* being based on political pressure.

Hundreds of disciplinary processes have taken place due to corruption in land allocations, and dozens of bureaucrats have been sanctioned for illegally allocating *baldíos* to

<sup>19</sup> Currently Agencia Nacional de Tierras, previously Incoder and previously Incora.

individuals with no rights to receive them, including political cronies, paramilitaries, enterprises and large landowners (Procuraduría General de la Nación, 2015).

Another source of discretion in land allocations comes from their timing. The land agency decides how long an approval process takes (it can take up to two years, Proyectamos, 2015). It also decides when and in which areas to promote the program and to focalize its limited bureaucratic capacity (e.g. through titling campaigns). As a recent evaluation shows, about a quarter of the land requests are the consequence of politicians or public officials motivating people to do so (Proyectamos, 2015)<sup>20</sup>.

The political interference on land allocations is facilitated by the operational structure of the land agency, and in particular, by how regional managers are appointed<sup>21</sup>. These are appointed by the national office, based on a short list of candidates proposed by local politicians. As mentioned by an expert in land reform interviewed<sup>22</sup> for this paper: *“clearly the Governor is not going to carry out written tests, he is going to name those who granted him votes”*. To which he added *“indeed, a gamonal, a landowner, could colonize some (public vacant) land, exploit it and then go to the regional manager, who was probably his friend, and he gave the title to him (...) clearly there is a direct relationship between elections and political issues, and the granting of public lands”*.

This statement is consistent with what land experts in Colombia have long denounced<sup>23</sup>. Machado (2001), for instance, asserts that the least favoured by land reform in Colombia have been peasants, as it has rather benefited rich landowners, as well as *“innumerable public officials cowering in corrupt practices and cronyism, as well as the political class in many regions”*. Recent evidence shows how the well organized and politically connected “agrarian bourgeoisie” has been the presumptive winner of the *baldío* allocation program in Colombia (Albertus, 2019). The work of Saffon (2015) also highlights how large landowners have leveraged their political power to obtain public

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<sup>20</sup> Albertus and Kaplan (2012) also mention that the regional focalization of land reform efforts was also affected by decisions taken in the Agrarian Reform Committee, in which landed elites and even congressmen participated.

<sup>21</sup> Referring to regional managers of Incoder. It is also worth noting that elite capture of land titling programs can also occur for other reasons. For example, Sitko, Chamberlin and Hichaambwa’s (2014) study of Zambia argues that land titling not only favours individuals with direct relations with the state, but also those with “the knowledge and economic capacity to navigate complex and convoluted bureaucratic systems”.

<sup>22</sup> The interviewee requested to remain anonymous. Interview carried out in Bogotá – July 2016.

<sup>23</sup> It is also consistent with investigations showing, for instance that Incoder’s bureaucracy was granted as quotas to local politicians involved in *parapolítica* in different areas of the country (Mondragón, 2008, Procuraduría General de la Nación, 2015).

lands since the mid-19<sup>th</sup> century. As Mondragon (2001) concludes “*land reform is linked indissolubly to patronage, trafficking of votes and violence*”.

As will be further discussed in the next subsection, during the period of study, the ideological platforms across political parties were similar and even coordinated, and party structures have significantly weakened throughout time. As such, in this context, the political land cycle is not expected to be solely existent under one party or another. This is specially so as the land reform program has a distributive rather than a re-distributive nature, lessening ideological concerns. In West Bengal, Bardhan and Mookherjee (2010) show similar evidence, discarding a relation between pre-electoral land allocations and the control of left parties.

### **1.3.2 Political institutions in Colombia**

Political institutions changed profoundly during the period analysed in this paper (1960-2015). The drafting of a new Constitution in 1991 consolidated a process of political reform that made institutions more inclusive. Before this shift, political power was narrowly distributed. There was a closed bipartisan system ruled by the hegemonic Liberal and Conservative parties. These two parties even established a formal power sharing agreement (the National Front, NF), which consisted of the alternation of presidential power every four years and of an equal division of parliamentary seats, ministerial posts and the judiciary<sup>24</sup>. The NF was formally in place between 1958 and 1974, although *de facto*, many of its practices remained in place for years; for instance, partisan parity was extended until 1978 and was practiced informally until 1986 (Bejarano and Pizarro, 2005).

Power was not only narrowly distributed across political parties, but also, and more generally, across society. The Colombian system was a restricted representative democracy with few direct participation mechanisms<sup>25</sup>. Power was also narrowly distributed across branches of government: the executive concentrated power, among others, appointing justices and ruling by decree and under a state of siege<sup>26</sup>. There was

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<sup>24</sup> During the NF, political competition was restricted, but it existed: anti-National Front candidates did run, albeit obtaining marginal vote shares, except in 1970 when an anti-National Front candidate (Gustavo Rojas Pinilla) nearly won the elections. Distributive politics remained relevant for this intraparty competition, and also as a strategy to assure legitimacy in a low turnout context (Galindo-Silva, 2015).

<sup>25</sup> Participation mainly took place through formal party structures, or informally through protest

<sup>26</sup> Or emergency/exceptional state, which conferred the President extra powers, for instance putting constitutional rules on stand-by. Palacios (1995) documents its systematic use and the authoritarian repercussions it had.

also a high concentration of power across levels of government, in a highly centralized system in which the elected president named governors, who in turn, named mayors.

In addition to political centralization, there was a high degree of fiscal centralization: the central government controlled most of the public budget. Finally, the Colombian state had an overall weak capacity, especially regarding the provision of public goods. As an illustration, school enrolment rate was 41%, and health coverage in rural areas was lower than 10%.

### ***The institutional shift***

The beginning of the 1990s saw a profound institutional change; one of the few deep shifts in power the country has ever experienced (Robinson, 2016)<sup>27</sup>. The drafting of a new constitution consolidated a shift towards more inclusive institutions, following a process of political opening and decentralization that began shortly before<sup>28</sup>. The demand for a change was generalized and broad. There was a national consensus regarding the need of a profound institutional change leading to the opening of democracy, the creation of a more inclusive economic model, the strengthening of public institutions and the resolution of the armed conflict (Serpa, 2013). The claim for change was strengthened by a massive student movement (*Séptima Papeleta*) and by the peace negotiations held at the time with guerrilla groups, especially with the urban guerrilla M-19, which explicitly pressured for institutional changes during the peace negotiations, including the drafting of a new constitution.

Overall, the demand for change was nationwide, being exogenous to particular municipality dynamics. The demand for change was also exogenous to land issues or to peasant/rural specific claims. Furthermore, the new constitution and its associated laws did not directly modify land allocation rules. For instance, of the 380 new constitutional articles, only one (Article 64) relates to land, corresponding to a broad declaration of the responsibility of the state in providing peasants progressive access to land and other services in order to improve their quality of life. I now discuss the main components of the institutional shift.

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<sup>27</sup> While fiscal and administrative state capacity increased, the coercive capacity of the State did not. Note that the reforms did not materialize homogeneously throughout the country. As Acemoglu and Robinson (2016) mention, Colombia remained in some ways, a “paper Leviathan”, unable to exercise complete and effective power over all of its citizens across all of its territory.

<sup>28</sup> With the expansion of local fiscal powers and the introduction of local elections, held for the first time in 1988.

### ***Broadening the distribution of power across political parties***

The new constitutional framework broadened the horizontal distribution of power. Multiparty competition was established through an open electoral system with few institutional barriers to entering the political competition (e.g. reducing the requirements for the creation of new parties, Bejarano and Pizarro, 2005). Furthermore, candidates were allowed to run for office without the support of a party, and partial public financing was introduced for campaigns and for the operation of parties. These reforms significantly increased political competition. For instance, the number of parties more than tripled between 1990 and 1998<sup>29</sup>.

### ***Broadening the distribution of power across societal actors***

In a more general sense, the distribution of power across societal actors was broadened. There was a shift from a restricted representative democracy, to a participatory one. Direct participation mechanisms were introduced, including referendums, popular consultations, revocation of mandate, open town meetings, municipal planning councils and Local Administrative Juntas. These mechanisms aimed at strengthening civic political participation and at increasing political accountability.

### ***Broadening the distribution of power across levels of government***

The shift also broadened the vertical distribution of power, specifically across levels of government. This was done through the introduction of mayoral and governor elections<sup>30</sup>. Political decentralization was accompanied by fiscal and administrative decentralization, a process in which local governments gained responsibilities, especially regarding the provision of public goods.

### ***Broadening the distribution of power across branches of government***

The reforms also broadened the distribution of power across branches of government. Checks and balances to constrain the power of the president were strengthened. Among others, a strong and independent Constitutional Court was created, and judicial oversight

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<sup>29</sup> From less than 4 to almost 20. Estimations based on Base electoral CEDE

<sup>30</sup> The first mayoral elections were held in 1988 for a period of two years. The period was extended to three years in 1991 and to four years in 2004. Governor elections were held for the first time in 1992.

and the role of Congress were strengthened (one example was reducing the majority required to override executive economic bills) (Cárdenas, Junguito and Pachón, 2008).

### ***Increasing the capacity of the state***

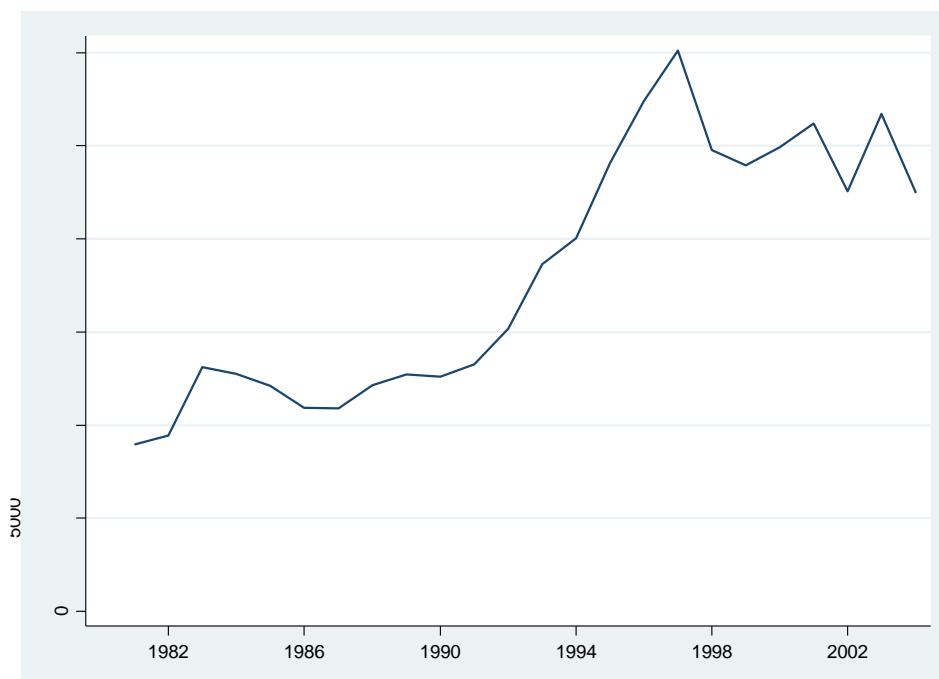
The second component of the shift towards more inclusive institutions was increasing state state, especially its fiscal and bureaucratic capacity to provide public goods. The reforms aimed at increasing expenditure responsibilities and fiscal resources, as well as at reducing vertical and horizontal fiscal imbalances through fiscal decentralization and through increases in intragovernmental transfers that would enable improvements in public goods provision. Total public investment doubled between 1993 and 1998<sup>31</sup>. The increase in fiscal capacity was accompanied with an increase in administrative capacity. Local governments received training and technical assistance (DNP, 2002), and stricter procedures of meritocratic recruitment and promotion of civil servants were introduced (Cárdenas, Junguito and Pachón, 2008). The reforms not only increased fiscal and bureaucratic capacity, but also established how resources were to be employed, determining that a certain share of public income had to be destined to public services including education, health and housing.

These reforms allowed public service delivery to rapidly and effectively improve: health coverage in rural areas increased from 10% to 70% between 1992 and 2011, and school enrolment rate raised from 41% in 1986 to 88% in 2011. The next figures evidence the sharp and rapid changes that took place.

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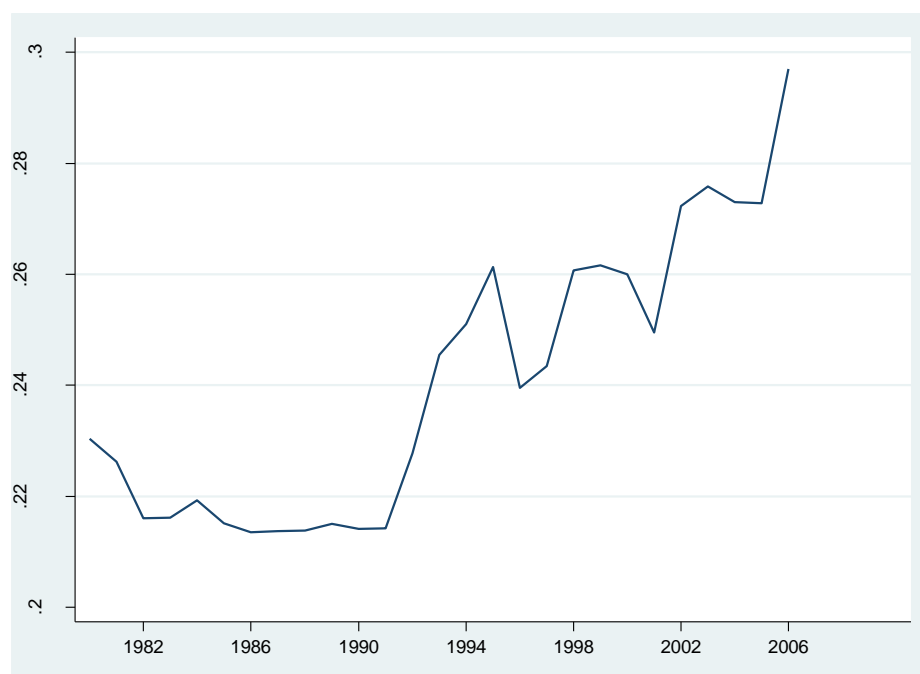
<sup>31</sup> Partly due to a re-composition of spending away from infrastructure and direct subsidies.

**Figure 1.2 Total public investment**  
Real thousand million COP



Source: DNP. Confis. Modelo de neteo DAF – Umacro.

**Figure 1.3 School enrolment rate**



Source: DNP and Ministry of Education, DANE. Rate estimated based on total population, as information on population per age groups is not available



## 1.4 Estimation Strategy

In order to identify how electoral interests (in particular, the timing of elections) affect the allocation of land, I estimate Equation 1.1:

$$LT_{i,t} = f(\beta_0 + \beta_1 E_t + \beta_2 E_t * PS_t + \beta_3 X_{i,t-1} + \mu_i + \delta_t + e_{i,t}) \quad Eq. 1.1$$

$LT$  is the number of land titles allocated in municipality  $i$  in period  $t$  (the size dimension of land allocations is addressed in the additional results section in the Annex). Data on land titles comes from Incoder and covers the period 1960-2015. The variable of interest is  $E_t$ , an electoral dummy that allows us to identify if land allocations are systematically higher in electoral years relative to non-electoral ones.  $E_t$  takes the value of one a year prior to elections. Profiting from the monthly frequency of the data,  $E_t$  is defined relative to the month during which presidential elections are held (May)<sup>32</sup>, that is, the panel is built based on electoral years (May to April), rather than on calendar ones. As Labonne (2016) and Akmedov and Zhuravskaya (2004) show, high frequency data allows for a cleaner identification of the political cycle, constituting an advantage of this paper relative to most studies employing calendar and yearly data.

The electoral dummy ( $E_t$ ) is exogenous, as the timing of elections is fixed and pre-determined by law. Note that the analysis focuses on elections for the executive (presidential races). This takes into account that the land allocations are carried out through a national program and thus, strategic considerations likely mainly respond to the national executive's political interests. It is less probable that legislative elections affect land allocation dynamics; nonetheless, if this was the case, these elections take place a couple of months before presidential ones, and thus the electoral dummy would capture both effects. Now, despite the program being national, local elections could also affect land allocations. This effect would not be captured by  $E_t$ , as local elections have an independent electoral calendar (they take place in the middle of the presidential term). The above is addressed in the robustness tests section, in which a separate estimation for the local PLC is carried out.

In order to analyse how the institutional shift affected the PLC,  $E_t$  is interacted with a post shift dummy ( $PS_t$ )<sup>33</sup>. As discussed earlier, the shift was exogenous to land allocation

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<sup>32</sup> A couple of races took place a month prior or after May.

<sup>33</sup> As mentioned before, the shift towards more inclusive institutions began briefly before the new constitution, which consolidated and formalized the institutional change. To account for the first changes,

dynamics: it did not respond to land-related or rural-related specific claims, nor to specific traits of any particular municipality. This makes  $PS_t$  an exogenous variable<sup>34</sup>.

Equation 1 controls for a set ( $X$ ) of municipality time-varying characteristics that can affect  $LT$ , including lagged population and rainfall shocks<sup>35</sup>. Additional covariates are included as a robustness test (for a subset of years for which additional information is available). The equation also includes a municipality fixed effect ( $\mu_i$ ) which captures time invariant observed and unobserved characteristics that affect  $LT$  (e.g. geographic characteristics like area and altitude). It also controls for fixed variables such as historic land conflicts and the average age of land titles granted before the 1961 land reform law, which as shown in Sánchez and Villaveces (2016), are determinants of land allocations in Colombia. The municipality fixed effect also controls for variables which vary slightly over time, such as land quality, inequality and geographical variations in political preferences. A year fixed effect ( $\delta_t$ ) is also included, capturing changes that occur during a given period and affect all municipalities, for instance, the macroeconomic cycle. The last term in the equation is the error ( $e_{i,t}$ ), clustered at the municipality level in order to control for potential serial and spatial correlation<sup>36</sup>. Descriptive statistics are presented in Table 1.A2 in the Annex.

The model is estimated through a conditional fixed effect Poisson regression, as the number of  $LT$  allocated in municipality  $i$  during period  $t$  is a count variable (i.e. non-negative and integer), and is censored at zero (as not all municipalities receive land titles in every period)<sup>37</sup>.

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PS is defined as post 1988, the year during which local elections were introduced. Results are robust when defining PS as post 1991.

<sup>34</sup> Institutional changes are not exogenous on aggregate, as they depend on initial institutional conditions, as will be further discussed, and as it is discussed in theories of This relates as well with theories of endogenous institutional change (Przeowski, 2015). However, in this case, the institutional change was exogenous to particular municipality land dynamics.

<sup>35</sup> This variable is constructed based on deviations from historical month-municipality average rain levels, relying on IDEAM data.

<sup>36</sup> Serial correlation and other time structure issues are addressed in the robustness test section, estimating models including a lagged dependent variable and time trends.

<sup>37</sup> Estimation through a Negative Binomial yields robust results, as discussed in the robustness tests section.

## 1.5 Results

### 1.5.1 Main results

The main results are presented in Table 1.2. They show that the allocation of land is affected by political considerations, in particular, by the timing of elections. The number of land allocations is systematically higher in electoral years relative to non-electoral ones; that is, there is a political land cycle. Furthermore, this cycle is dependent on the political institutions in place: its magnitude is reduced by half after the institutional shift (the Incidence Rate Ratio<sup>38</sup> drops from 8.8 to 4.3). The results are robust to the inclusion of controls (Column 2).

**Table 1.2 - The Political Land Cycle**

Dependent Variable: Number of Land Titles allocated (LT)		
	(1)	(2)
Pre Electoral year (E)	2.099*** [0.140]	2.173*** [0.141]
E* Post Shift	-0.723** [0.176]	-0.708** [0.178]
Log-Likelihood	-528826.96	-516351.34
Observations	56,430	55,510
Number of Municipalities	1,026	1,025
Municipality FE	YES	YES
Year FE	YES	YES
Municipal Controls	NO	YES
Mean Land Titles	8.234	8.234

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks.

The finding that the PLC weakens after the shift towards more inclusive institutions is consistent with the literature on distributive politics, showing that the politically motivated allocation of resources is weaker in contexts of mature democracies (Brender and Drazen, 2003; Mandon and Cazals, 2018; Akmedov and Zhuavskaya, 2004) and of mature bureaucracies (Bustikova and Corduneanu-Huci, 2017).

<sup>38</sup> IRR for a Poisson models is the exponential of the coefficient. In this case, it indicates how many times larger the number of land allocations is in electoral years relative to non-electoral ones.

### **1.5.2 Heterogeneous effects: Initial institutions and institutional change**

I now analyse whether the effect of the institutional shift (which was a national level reform) was heterogeneous across municipalities with different initial institutional conditions. I build on the institutional literature positing that institutional changes do not act in a vacuum, but interact with the pre-existing institutional context (Clark and Ghandi, 2015; Haber and Menaldo, 2011; Heybey and Murrel, 1999), and more specifically, by how inclusive initial institutions (Acemoglu, Johnson and Robinson, 2005).

I analyse heterogeneity in initial institutions at the subnational level. To this end, I build on Fergusson et al.'s (2017) study of Colombia, discussing the existence of two types municipalities with structurally different institutional traits: core municipalities (or central areas) have more inclusive institutions, whereas periphery municipalities (or isolated areas), have less inclusive ones<sup>39</sup>. Core and periphery municipalities can be identified through different approaches. Montenegro-Helfer (2017) focuses on population density (i.e. disperse isolated areas have small populations), while Fergusson et al. (2017) rely on poverty, displacement and other socioeconomic data, as periphery municipalities lag on these traits.

I identify the core and the periphery directly analysing the location of municipalities. I define core municipalities as those located close to department capitals (at a distance shorter than the within department average). This definition can be understood as a measure of exposure to inclusive institutions, which are centralized in capital cities (i.e. public agencies, central police offices, central markets, etc. are located there). These institutions do not always have a reach on faraway areas, especially considering the Colombian geography and the precarious road infrastructure. This approach is consistent with Robinson's (2016) argument regarding the fractal nature of the periphery in Colombia, where there is not just one core and one periphery, but rather many cores and many peripheries throughout the territory.

To illustrate differences in initial institutions, I run difference in means tests between core and periphery municipalities for various variables. To measure how broad the initial division of political power was, I analyse differences in the Effective Number of

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<sup>39</sup> The core-periphery contrast relates to Gibson's (2013) theory of subnational authoritarianisms, highlighting how in developing countries, it is common to find a coexistence of regimes (norms, rules and practices) within the same territory.

Competing Parties (ENCP)<sup>40</sup>, as well as in the share of municipalities in which the anti-bipartisan political party ANAPO won the presidential elections of 1970<sup>41</sup>. I measure initial fiscal capacity as initial property tax revenues, and initial bureaucratic capacity for public good provision as initial school enrolment rates. I also measure state capacity through a historical variable indicating the presence of Spanish colonial settlements, which as Fergusson et al. (2017) show, proxies for state capacity as the location of the Colombian state follows path dependency from the colonial one. A final measure is an indicator of bipartisan violence during La Violencia period, relating to coercive capacity. The results on Table 1.3 show that core municipalities had more inclusive initial institutions, under all of the analysed dimensions.

**Table 1.3 Differences in initial institutions – Periphery and Core**

		Periphery	Core	Difference
<b>Distribution of political power</b>	Effective Number of Competing Parties (ENCP)	1.677	1.738	***
	Strong political competition (Anapo- 1970) (%)	42.5	47.5	***
<b>State capacity</b>	Property tax revenue (1964)	3.734	4.571	**
	School enrolment rate (1964)	31.85	35.01	***
	Spanish colonial settlement 1500s (% mun.)	34.14	38.8	***
	Bipartisan violence (1948-1953) (% mun.)	19.5	8.4	***
<b>Others</b>	Population	11,172	16,715	***
	Distance to Department capital	126	63.4	***
No. Municipalities		499	619	

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Information on property tax revenue and school enrolment rate in 1964 was provided by Orduz (2019), digitized from the 1964 national census. ENCP and population averaged during the pre-shift period, with information from CEDE. Spanish colonial settlements is a dummy indicating whether there was a colonial settlement in the 1500s, and bipartisan violence is a dummy indicating whether there was political violence during the period of La Violencia. Information on both variables comes from the municipal panel of CEDE. Distance to department capital also published in the municipal panel of CEDE

I now analyse how initial institutions condition institutional change. I estimate a Probit model for the likelihood of a municipality experiencing a strong response to the national level institutional shift. I focus on two aspects: a strong (stronger than average) increase in political competition and a strong increase in social spending. The results on Table 1.4 show that being a core municipality (i.e. having more inclusive initial institutions)

<sup>40</sup>  $ENCP_t = \frac{1}{\sum_{k=1}^K P_{kt}^2}$  where  $P$  is the vote share of each party. Estimated for the pre-shift period.

<sup>41</sup> These were the only elections in which third party competition was meaningful during the pre-shift period

increases the likelihood of experiencing a strong increase in political competition and a strong increase in social spending. The results further evidence that this compound measure of institutional inclusiveness is more important than independent measures of initial political competition or initial state capacity.

**Table 1.4 Likelihood of experiencing a strong response to the national shift**

Dependent variable: Likelihood of		
	High increase in political competition (1)	High increase in social spending (2)
Core municipality	0.242*** [0.033]	0.057* [0.034]
Strong political competition (Anapo- 1970)	0.042 [0.034]	-0.005 [0.033]
Bipartisan violence (1948-1953)	0.045 [0.049]	0.038 [0.048]
Spanish colonial settlement (1500s)	0.025 [0.034]	-0.090*** [0.034]
Log-Likelihood	-618.19544	-636.06445
Observations	932	926

Regressions estimated through a Probit model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Information from Panel Municipal CEDE and base electoral CEDE. Strong political competition is a dummy that indicates whether the third party ANAPO had a higher than average vote share in the 1970 elections. Spanish colonial settlements is a dummy indicating whether there was a colonial settlement in the 1500s. This is a proxy for state capacity. Bipartisan violence is a dummy that takes the value of one if there was violence during La Violencia period.

These results evidence how initial institutions condition effective institutional change: where initial institutions were more inclusive (the core), institutional change was enhanced; and where they were less inclusive (the periphery), institutional change was limited<sup>42</sup>. These findings are consistent with those of Acemoglu, Johnson and Robinson (2005), showing that institutional change (related to the protection of private property) derived from transatlantic trade in imperial Europe was stronger in countries in which initial institutions were more inclusive (measured as those in which initial checks and balances on the monarchy were stronger).

<sup>42</sup> This is consistent with Fergusson et al.'s (2017) work highlighting how Colombian elites have few incentives to launch real state-building projects in the periphery, as preserving its backwardness is instrumental: it allows to continue with the extraction of political and economic rents.

Following a similar line of argument, I now show that the effect of the institutional shift on the PLC was stronger in core municipalities. To this end, I estimate the PLC separately for core and periphery municipalities. Estimating political cycles on subsamples is a common approach in the literature (Eible and Lynge-Mangueira, 2017; Labonne, 2016; Efthyvoulou, 2012; Shi and Svenson, 2006). In this case, it is preferred to the alternative of including triple interactions which make interpretation difficult and introduce problems of multicollinearity (e.g. five sets of interactions in one sole equation).

The results, presented on Table 1.5, evidence that the pre-shift PLC was smaller in the core (i.e. areas with more inclusive institutions), and that the post-shift reduction in the PLC was stronger; that is, where the institutional shift acted more strongly, the reduction in the PLC was stronger. The *E\*Post Shift* coefficients are statistically different in both subsamples<sup>43</sup>.

**Table 1.5 The PLC – Municipalities in the periphery and the core**

Dependent Variable: Number of Land Titles allocated (LT)		
	Periphery	Core
Pre Electoral year (E)	2.537*** [0.186]	1.936*** [0.193]
E* Post Shift	-0.509* [0.285]	-0.857*** [0.186]
Log-Likelihood	-284663.82	-226304.59
Observations	24,563	30,947
Number of Municipalities	453	572
Municipality and year FE	YES	YES
Municipal Controls	YES	YES
Test of coefficient equality (E*Post shift) – P-value	0.061	

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. Post shift IRR is 2.9 in the core vs. 7.6 in the periphery.

<sup>43</sup> The results are the same when using an alternative measure of core municipalities: those located at a distance from Bogota below the national mean. Results estimated separately for each region are also consistent with the core – periphery hypothesis. The reduction in the PLC is significant in central areas of the country (Andean and Orinoquia) but is not significant in the periphery (Caribbean, the Pacific and the Amazon).

### 1.5.3 Mechanisms: the re-composition of distributive politics

I now explore the mechanisms that explain the reduction in the political land cycle. I focus on both the incentives and the capacity of politicians to mobilize voters via strategic allocations of different resources. The results point towards the reduction in the PLC being the result of a re-composition of distributive politics: from the strategic allocation of targeted private benefits (in this case, land), to the strategic allocation of public goods. I argue that before the shift, when political power was narrowly distributed and state capacity was weak, it was efficient to mobilize voters relying on patronage networks to allocate small numbers of targeted private benefits, and in particular, land, which as previously discussed, is easy and cheap to target and allocate, and is highly valued by voters. I argue that this equilibrium was modified after the institutional shift, which generated both the incentives and the capacity to re-compose voter mobilization strategies, orienting them less towards targeted private benefits, and more towards public goods<sup>44</sup>.

#### *Stronger incentives to mobilize voters via public goods*

As previously mentioned, one of the most significant changes derived from the institutional reform was the introduction of a multiparty system, which significantly increased political competition<sup>45</sup>. The relation between political competition and distributive politics is not straightforward. One could expect political competition to strengthen distributive politics: if elections become more threatening, there are stronger incentives to strategically allocate resources seeking electoral support.

However, this effect most likely depends on the type of resource to be allocated. More specifically, I posit that political competition should increase the incentives to mobilize voters via the strategic allocation of public goods, rather than through targeting private benefits like land. This argument is in line with that of Diaz-Cayeros, Magaloni and Stévez (2016), who show that increases in political competition in Mexico led to a “diversification of electoral investments” towards public goods. The authors argue that when a party’s core base of support is not sufficient to win elections (as in contexts of

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<sup>44</sup> This does not imply that land and public goods are substitute goods (e.g. allocating more land implies allocating less public goods), but rather that because of changes in incentives and capacities, voter mobilization strategies shift towards certain resources and away from others.

<sup>45</sup> On average, the Effective Number of Competing Parties (ENCP) increased from 1.712 to 2.463.



strong political competition), politicians have incentives to mobilize support from other groups of voters (with varying political preferences), what is more easily done through investments in public goods, which appeal to a broader and more heterogeneous set of voters. Furthermore, in competitive systems with a large number of political parties, the coordination costs of allocating targeted private benefits through patronage networks and political intermediaries can increase (as the demand for them increases, de Haan and Klomp, 2013). This constitutes another relative advantage of allocating public goods rather than private ones.

Evidence for the Colombian case is consistent with the above. For instance, Sánchez and Pachón (2013) show that increases in political competition have a positive impact on public service provision. More broadly, this argument is consistent with studies showing that democracy increases public good provision and expenditure (Kroth, Larcinese and Wehner, 2016; Min, 2015; Bueno de Mesquita et al. 2003). It is worth discussing the opposing findings of Chhibber and Nooruddin (2004). The authors find that localities in India in which elections can be won with a narrower margin (i.e. where there is multiparty competition) politicians favour private benefits rather than public goods. This differs from the Colombian case, in which to win presidential elections, cross-cleavage coalitions are often needed. In any case, as Ferguson, Larreguy and Riaño (2018) mention, the relation between political competition and public good provision is plausibly non-monotonic.

In order to analyse the relation between political competition and the distributive politics of land, I estimate the PLC on two sets of municipalities: those which experienced a low (below average) increase in political competition, and those which experienced a high one. Increases in political competition are measured as the difference between the post and pre shift average Effective Number of Competing Parties, based on data from the electoral database of CEDE. Note that this analysis separates the sample based on outcomes of the institutional reform. While this generates problems for identifying causal links, in this case the aim is precisely to illustrate differential effects of the reform, seeking to illuminate the mechanisms acting.

Table 1.6 presents the results. Consistent with the aforementioned argument, they evidence that the reduction in the PLC is stronger in the municipalities that experienced a high increase in political competition; that is, those with stronger incentives for re-composing voter mobilization strategies away from targeted private goods and towards public ones. The post-shift coefficients in both samples are statistically different.

**Table 1.6 The PLC – Municipalities with a low and high increase in political competition**

Dependent Variable: Number of Land Titles allocated (LT)		
<b>Increase in political competition</b>	<b>Low (1)</b>	<b>High (2)</b>
Pre Electoral year (E)	2.047*** [0.206]	2.251*** [0.197]
E* Post Shift	-0.709*** [0.190]	-1.136*** [0.259]
Log-Likelihood	248628.12	-231831.92
Observations	26,147	25,273
Number of Municipalities	481	466
Municipality and year FE	YES	YES
Municipal Controls	YES	YES
Test of coefficient equality (E*Post shift) – P-value	0.089	

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets.  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks.  
 The post shift Incidence Rate Ratios are 0.95 and 0.85.

There are additional traits of political institutions likely affecting the incentives to strategically allocate certain type of resources. In particular, incentives should be affected by how responsive and accountable politicians are to the demand of voters, and on what these demands are. Both political responsiveness and accountability improved after the institutional reform. First, through the introduction of local elections, which as the literature on decentralization states, aims at bringing voters closer to politicians (Faguet, 2012; Treisman, 2007). Political responsiveness and accountability likely increased as well through the introduction of direct participation mechanisms (e.g. open town meetings, public consultations, referendums), and through the strengthening of executive constraints that limited the ability of politicians to do as they wish (including manipulating the allocation of resources at their own convenience). Empirical evidence for Colombia backs the above. The work of Faguet and Sánchez (2014) documents how after the process of political reform and decentralization, politicians became more

responsive to the demands of voters. They further argue that voter's primary demand was increasing the provision of public goods<sup>46</sup>.

Based on the above line of argument, we should find the reduction in the PLC to be stronger in municipalities with stronger political accountability. To test this, I rely on information from the index of transparency and accountability of the Attorney General's Office<sup>47</sup>, which reflects the strength of mechanisms to strengthen state-citizen relations and to reduce corruption. I estimate the PLC on municipalities with high and low transparency and accountability. The results in Table 1.7 show that indeed, the reduction in the PLC is only significant in municipalities with a high level of accountability and transparency; that is, those that should have experienced stronger incentives to re-compose their distributive politics strategies away from targeted benefits and towards demanded public goods<sup>48</sup>.

**Table 1.7 The PLC –  
Municipalities with low and high accountability and transparency**

Dependent Variable: Number of Land Titles allocated (LT)		
<b>Accountability and transparency</b>	<b>Low (1)</b>	<b>High (2)</b>
Pre Electoral year (E)	2.411*** [0.209]	2.053*** [0.181]
E* Post Shift	-0.145 [0.277]	-1.248*** [0.174]
Log-Likelihood	-244063.8	-266713.6
Observations	24,308	31,092
Number of Municipalities	448	574
Municipality and year FE	YES	YES
Municipal Controls	YES	YES
Test of coefficient equality (E*Post shift) – P-value	0.000	

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks.

<sup>46</sup> There are additional traits of political institutions likely affecting the composition of distributive politics. For example, Persson and Tabellini (2000) state that systems of proportional representation provide more public goods and less targeted benefits than majoritarian systems.

<sup>47</sup> The transparency and accountability index is part of the Open Government Index. This information is only available for the post period, so it is measured as a high ex post average, rather than as a pre and post shift increase. Nonetheless, persistence in this institutional trait is likely.

<sup>48</sup> Although the reforms to increase accountability took place at the national level, effective institutional change is likely heterogeneous across municipalities (i.e. according to whether initial institutions enhance or limit the scope for change), as discussed in the previous subsection.

High is defined as being above the national mean (averaged 2000-2014). The post shift IRR for the high category is 0.88.

The above results are in line with the literature on distributive politics showing that in general, in contexts of greater transparency and accountability, the political manipulation of resource allocation is lower as voters are able to detect and punish it (Alt et al. 2014; Shi and Svensson, 2006). However, the scope of this mechanism arguably has a demand-side component. For example, voters might punish the manipulation of certain goods less than others. In this case, the reforms generating greater transparency could make some types of distributive politics (e.g. the PLC) less attractive, while making others more attractive (e.g. public goods which are demanded broadly by voters).

### ***Increased capacity to provide public goods***

The re-composition of voter mobilization strategies away from targeted private benefits and towards public goods requires not only the incentives, but also the capacity (fiscal and bureaucratic) to do so. While increased fiscal and bureaucratic capacity should increase the ability to provide any type of good, the effect should be stronger for public good provision, which are more reliant on bureaucratic capacity, and on fiscal resources (Fergusson, Larreguy and Riaño, 2018). Indeed, allocating a land title has a low fiscal cost and is a simple bureaucratic process, relative to building a hospital or connecting houses to the water or electric system.

The capacity argument implies that the PLC should have decreased more in municipalities with a stronger fiscal and bureaucratic capacity to provide public goods. To test this, I estimate the cycle comparing municipalities with a low and a high efficiency in public good provision. The efficiency measure comes from the Integral Performance Index of the National Planning Department (DNP)<sup>49</sup>, and refers to the provision of a maximum level of output (in health, education and public services) given a level of input. Table 1.8 shows that, consistent with the argument, the reduction in the PLC is only significant in the municipalities with a high efficiency in public good provision; that is those with a higher capacity to mobilize voters via public goods.

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<sup>49</sup> The Integral Performance Index is a composite measure (scale of 0 to 100) of efficiency, efficacy, compliance with legal requirements and management (DNP, 2013). Information is only available for the post period, thus it is measured in average levels, rather than in pre and post changes.

**Table 1.8 The PLC –  
Municipalities with low and high efficiency in public good provision**

Dependent Variable: Number of Land Titles allocated (LT)		
<b>Public good provision efficiency</b>	<b>Low (1)</b>	<b>High (2)</b>
Pre Electoral year (E)	2.145*** [0.211]	2.173*** [0.185]
E* Post Shift	-0.232 [0.236]	-1.557*** [0.181]
Log-Likelihood	-278659.83	-232773.75
Observations	27,105	28,405
Number of Municipalities	504	521
Municipality and year FE	YES	YES
Municipal Controls	YES	YES
Test of coefficient equality (E*Post shift) – P-value	0.000	

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. High is defined as being above the national mean (averaged 2000-2014).

As further tests, I estimate the PLC comparing municipalities with a low and a high level of bureaucratic capacity, relying on information from the World Bank on the total number of public agencies per capita in a municipality. I also compare the cycle across municipalities with a low and a high increase in spending on public goods, based on information from the municipal panel of CEDE. Consistently, the results in Tables 1.A3 and 1.A4 in the Annex show that the decrease in the PLC was stronger in the municipalities with a stronger bureaucratic and fiscal capacity.

### ***The political cycle in public good spending***

To provide further evidence on the re-composition of distributive politics, I now show that while the post shift period saw a decrease in the PLC, it saw an increase in the political cycle of spending on public goods. Table 1.9 shows that the effect of the electoral cycle on public good spending is positive and that it becomes larger after the institutional shift. In Column 2, I show that the effect is significantly stronger for spending on public goods than for less visible types of spending, in particular, current spending (salaries and other administrative inputs).

**Table 1.9 The Political Budget Cycle –Spending on public goods**

Dependent Variable: (Log) spending		
	Spending on public goods	Current spending
Pre Electoral year (E)	0.462*** [0.042]	0.125*** [0.009]
E* Post Shift	2.634*** [0.068]	0.633*** [0.028]
Lag spending	0.404*** [0.011]	0.497*** [0.019]
Observations	28,700	29,149
Number of Municipalities	1,097	1,097
Municipality and year FE	YES	YES
Municipal Controls	YES	YES
R-Squared	0.869	0.842

Regressions estimated through a Fixed Effect model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. Public spending on public goods per capita in real terms. Public spending on public goods is equivalent to spending on net formation of fixed capital (e.g. schools) plus associated spending (e.g. school material). There is a public good spending cycle in pre local electoral years as well, of a similar magnitude.

The previous results are consistent with the work of Drazen and Eslava (2010) showing that spending on public goods in Colombia is affected by the electoral cycle<sup>50</sup> and that these targeted expenditures are stronger in swing municipalities (i.e. allocations also follow geographical targeting). These authors argue that the strategic expenditure in public goods is an attractive strategy because these are highly visible and can benefit specific (yet large) groups of voters. Overall, these results evidence that public good allocations are also strategically targeted following political considerations, rather than being fully programmatic goods (i.e. universally allocated irrespective of geographic location, partisan affiliation or other political considerations, Golden and Min, 2013)<sup>51</sup>.

<sup>50</sup> This study focuses on local elections for the period 1987 to 2002.

<sup>51</sup> It is worth noting, as these authors do, that the classification of goods as programmatic, patronage, pork barrel or clientelist is not-straightforward, as there are various definitions for each of these terms, and as the classification entails a deep knowledge of local contexts to determine the true nature of allocations.

## 1.6 Robustness tests

In order to check for the robustness of the results to the estimation method, I run six alternative models. In column (1) of Table 1.10, I estimate a dynamic fixed effects Poisson model, including a lag of the dependent variable as a regressor. This approach is common in the political budget cycle literature, as it captures the dynamics of the dependent variable more parsimoniously<sup>52</sup>. In column (2) I estimate a Poisson model logging the number of land titles to incorporate some of the level changes that occurred in land titling after the 1990s. I also estimate the model including a region-specific time trend (column 3), to control for heterogeneous time dynamics across regions, capturing for instance, different geographical limits to the agricultural frontier (Albertus, 2019). In the last two columns I allow for alternative distributional assumptions in the count data, using a Negative Binomial and a standard FE model. The results are qualitatively unchanged in all of the specifications.

**Table 1.10 Robustness to alternative estimation strategies**

	Dynamic Poisson (1)	Log Poisson (2)	Poisson – Region time trend (3)	Negative Binomial (4)	FE (5)
Pre Electoral year (E)	2.012*** [0.131]	1.402*** [0.081]	2.184*** [0.198]	2.036*** [0.155]	8.913*** [0.845]
E* Post Shift	-0.788** [0.152]	-0.585*** [0.069]	-1.664*** [0.268]	-0.817*** [0.186]	-4.749*** [1.076]
Lagged land titles	0.005*** [0.0004]				
Log-Likelihood	-476480.08	- 51959.04	-441616.4	-110721.43	N.A
Observations	55,510	55,510	54,370	60,224	60,224
Number of Municipalities	1,025	1,025	994	N.A	1,117
Municipality FE	YES	YES	YES	N.A	YES
Year FE	YES	YES	NO	YES	YES
Municipal Controls	YES	YES	YES	YES	YES

Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. The number of observations in log Poisson is low because it drops zeros. Cubic time trend is interacted with the five regions in Colombia.

<sup>52</sup> This is more important in budget variables with a high serial autocorrelation than in land allocation, which exhibits a high volatility. Dynamic models are often estimated with GMM as the lag introduces bias. However, in this case, the number of time periods is large (T=55), and thus the bias should be marginal (Beck and Katz, 2011). Considering this, I estimate a regular FE model.

Now, to test for the robustness of the results to omitted variable bias, I estimate the PLC including additional covariates for the sub-period (1999-2014), for which additional information is available. These include transfers from the central and departmental government, in order to control for public investment in the agricultural sector and others, as this could affect the demand for land. I also control for local tax revenues as a measure of the dynamism of the local economy, capturing, for instance, specific price shocks that affect municipalities differently<sup>53</sup>. As a proxy for poverty, I include subsidized health coverage, and to account for changes in local state capacity, I include the Municipal Fiscal Performance Index. As shown in Table 1.11, the results are robust to the inclusion of additional controls.

**Table 1.11 Robustness to additional covariates**

Dependent Variable: Number of Land Titles allocated			
	(1)	(2)	(3)
Pre Electoral year	1.324** [0.230]	1.234*** [0.231]	0.853*** [0.259]
Population		0.000 [0.000]	0.000 [0.000]
Rainfall shocks		0.014 [0.018]	0.011 [0.018]
Lag Local fiscal revenue			-0.137 [0.393]
Lag National transfers			-0.251 [0.666]
Lag Subsidized health coverage share			0.280 [0.196]
Lag Municipality Fiscal Performance Index			0.006 [0.005]
Log-Likelihood	-92607.767	-91638.207	-86106.681
Observations	12,660	12,559	11,298
Number of Municipalities	844	844	834
Municipality and year FE	YES	YES	YES

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Local fiscal revenue and national transfers in real per capita terms. Information comes from Panel municipal CEDE. Covariates are lagged to lessen potential simultaneity, nonetheless, regressors can be endogenous; thus, the results should be interpreted with caution. Information comes from Panel Municipal CEDE.

Despite the allocation of land being carried out through a national program, local elections could affect the timing of allocations. To test for this, I estimate the PLC including a dummy for local elections rather than for presidential ones. Local elections are held between presidential races (in October). Note that this specification does not include an

<sup>53</sup> This would capture coffee price shocks, which Albertus (2019) show affect the allocation of land in Colombia.



interaction with the post shift dummy, as local elections only take place during the post-shift period<sup>54</sup>. The results in Table 1.12 show that local elections do affect the allocation of land. However, the effect is significantly lower than that of presidential races (IRR of 2.8 vs 8.8), suggesting that the effect captured by the original electoral dummy for presidential races is the relevant one to focus on. As an additional test, I run the main PLC estimation excluding two years during which both presidential and local elections took place (1990 and 1994). The results (presented in Table 1.A5 in the Annex) hold, indicating that the main effect is not driven by these special cases.

**Table 1.12 The local political land cycle**

Dependent Variable: Number of Land Titles allocated	
	(1)
Pre Local Electoral year (LE)	1.015*** [0.192]
Log-Likelihood	-209904.07
Observations	26,226
Number of Municipalities	980
Municipality FE	YES
Municipal Controls	YES

Note: Estimated on the post period. Elections take place between presidential elections, in October. Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

I also test for the robustness to exclusion of outliers. Table 1.A6 in the Annex presents the results excluding municipalities that have an extreme number of land titles allocated for the whole period of study, as well as excluding municipality-year observations with abnormally high land allocations. The results remain unchanged in both. Finally, I exclude elections one by one<sup>55</sup>, and rule out that the effects are driven by a particular race. Overall, the robustness tests provide confidence of the political land cycle, as well as of the effect of the institutional shift.

### 1.7 Ruling out alternative explanations

I now analyse whether other dynamics could explain the observed reduction in the PLC. I first explore the possibility that the reduction is due to the escalation of the armed conflict during the 1990s, which displaced rural inhabitants and forced them to abandon

<sup>54</sup> Elections take place in October. The first elections were held in 1988, the second in 1990 (together with presidential ones).

<sup>55</sup> Results available upon request.

over 7 million hectares of land (URT, 2010). The surge in violence and in tenure insecurity could have reduced the demand for land allocations. It could also have reduced the expected return of land patronage or even the agency's ability to operate in a region (i.e. reducing the supply of land patronage). This, rather than the shift in political institutions, could explain the reduction in the PLC.

If this were the mechanism acting, we should find the PLC to have decreased more in the municipalities which experienced more land dispossessions. To test this, I run the main estimation on two sets of municipalities: those with a low (below average) and with a high number of land dispossessions per capita. Information comes from the Land Restitution Unit. Table 1.13 shows that the post shift reduction in the PLC in both groups of municipalities is similar in magnitude and is not statistically different. This result indicates that this is not the mechanism behind the reduction in the PLC. The results are consistent when relying on another measure of violence (increases in the per capita number of violent attacks from armed groups)<sup>56</sup>.

**Table 1.13 The PLC -Municipalities with high and low land dispossessions**

Dependent variable: Number of Land Titles allocated		
<b>Land dispossessions</b>	<b>Low (1)</b>	<b>High (2)</b>
Pre Electoral year (E)	2.252*** [0.219]	2.104*** [0.189]
E* Post Shift	-0.775*** [0.174]	-0.663*** [0.286]
Log-Likelihood	-302315.24	-210827.24
Observations	43,339	12,171
Number of Municipalities	800	225
Municipality and year FE	YES	YES
Municipal Controls	YES	YES
Test of coefficient equality (E*Post shift) – P-value	0.521	

Regressions estimated through a Fixed Effect model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks.

A second potential explanation for the reduction in the PLC could be the agricultural crisis of the beginnings of the 1990s. The economic liberalization process (*apertura económica*) liberalized trade, eliminating protectionist policies such as price controls, tariffs, quotas and state commercialization (Ocampo, 2017). These measures particularly harmed the agricultural sector (Ocampo and Perry, 1995), significantly decreasing

<sup>56</sup> Information comes from the Human Rights Office of the vice-presidency.

agricultural GDP<sup>57</sup>. This negative economic shock could have decreased the demand for land allocations, as well as the potential return of land patronage<sup>58</sup>.

In order to test for this, I categorize municipalities into two groups: those with a high and with a low exposure to the economic liberalization. A municipality is considered to have had a high exposure if it produced at least two of the products which were hit the most by the *apertura económica*. These include cotton, wheat, rice, barely, sugar, soy and maize (Ocampo and Perry, 1995; Padilla, 2005). Information comes from the Agriculture Evaluations from the Ministry of Agriculture<sup>59</sup>.

If this were the mechanism acting, we should see the reduction in the PLC to be stronger in the municipalities with a higher exposure to the economic liberalization. The results in Table 1.14 show this was not the case, as the coefficients are not statistically different between groups<sup>60</sup>.

**Table 1.14 The PLC - Municipalities with high and low exposure to the economic liberalization**

Dependent variable:		
<b>Exposure to economic liberalization</b>	<b>Low (1)</b>	<b>High (2)</b>
Pre Electoral year (E)	2.301*** [0.222]	2.102*** [0.174]
E* Post Shift	-0.964*** [0.230]	-0.608*** [0.226]
Log-Likelihood	-193861.77	-318742.8
Observations	25,858	29,652
Number of Municipalities	475	550
Municipality FE	YES	YES
Municipal Controls	YES	YES
Test of coefficient equality (E*Post shift) – P-value	0.122	

Regressions estimated through a Fixed Effect model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. Post shift IRR are 5.4 and 4.4.

<sup>57</sup> Aggravated by a decrease in international prices (Ocampo and Perry, 1995).

<sup>58</sup> The recent work of Albertus (2019) shows that land allocations are indeed affected by trade shocks, in particular, by the price of coffee.

<sup>59</sup> This information is only available after 2007, however, land suitability and land use should not change dramatically within a relatively short period of time, and as such, areas with the potential to produce these products should remain relatively constant. Note that because of this limitation in data, I do not use a threshold on tons or area cultivated, but rather whether a product is cultivated in a certain municipality.

<sup>60</sup> Furthermore, as Ocampo and Perry (1995) note, a sectoral reform (*plan de reactivación*) in 1994 was carried out to face the agricultural sector, with new tools such as the *Incentivo de Capitalización Rural*. In this sense, the crisis was not a structural long term change, as was the change in political institutions.

Another potential explanation for the reduction in the PLC is that it resulted from specific changes in the land reform law, rather than from broader changes in political institutions. A new land reform law (Law 160) was approved in 1994. This law defined stricter criteria for land titling (at least in paper), and shifted the government's efforts towards market based land reform<sup>61</sup>. Both aspects could have reduced the demand for *baldío* allocations as well as the supply of land patronage. Aggregate land allocations did decrease after the implementation of Law 160. However, aggregate reductions do not imply reductions in the PLC (i.e. allocations around elections). To test for this alternative explanation, I estimate the PLC excluding post 1994 elections (i.e. those affected by the new land reform law). Column 1 in Table 1.15 shows that the results hold: the PLC decreased after the institutional shift (although the coefficient is smaller, it remains significant). As a related test, in Column 2, I run the results excluding the period of lowest aggregate land allocations (1995 to 2004). Again, the results hold.

**Table 1.15 Excluding elections on sub-periods of low land allocations**

Dependent Variable: Number of Land Titles allocated (LT)		
	Excluding elections post 1994 (1)	Excluding elections during the low aggregate allocation period (2)
Pre Electoral year (E)	2.176*** [0.141]	2.175*** [0.141]
E* Post Shift	-0.189*** [0.093]	-0.707*** [0.178]
Log-Likelihood	-459168.77	-501973.64
Observations	50,021	5,318
Number of Municipalities	1,016	1,022
Municipality and year FE	YES	YES
Municipal Controls	YES	YES

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets.  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

I consider one last alternative explanation for the reduction in the PLC. Rather than a re-composition of distributive politics between targeted private benefits (land) and public goods, there could have been a re-composition of distributive politics from one type of targeted private benefit to another. This could happen, for instance, if there was resource exhaustion (i.e. if vacant land was running out, voters would have to be mobilized via

<sup>61</sup> Granting a subsidy for the plot of land the farmer has directly negotiated with a buyer. This form of land reform remained marginal.

another private good). However, the resource exhaustion hypothesis is unlikely, as land allocations increased significantly after 2010, reaching 1970s levels. One targeted private benefit that could have replaced land patronage is agricultural credit. However, Benson et al. (2019) do not find evidence of a political cycle in agricultural credit<sup>62</sup>. A re-composition towards direct subsidies is also unlikely, as several of these were dismantled with the economic liberalization<sup>63</sup>. Similarly, it is unlikely that the results are explained by a re-composition towards Conditional Cash Transfers, as these began to be granted a decade after the institutional shift. Furthermore, there are no reasons to think the institutional shift led to a re-composition of distributive politics within targeted private benefits, as the reforms were rather oriented towards increasing public good provision.

Before concluding, I discuss one additional analysis carried out. I analyse the class dimension of distributive politics, differentiating the PLC according to who were the recipients of land. To this end, I classify land titles within each municipality as small and large<sup>64</sup>. As social class in rural areas is largely configured by type of land access, small plots are likely allocated to peasants, whereas large land plots are likely allocated to large agricultural producers. The results evidence that the PLC is significantly stronger for small plots (see table 1.A7 in the Annex). This is consistent with standard theories of distributive politics arguing that politicians favour small allocations due to their cost effectiveness (Dixit and Londregan, 1996; Brusco, Nazareno and Stokes, 2004; Kitschelt and Wilkinson, 2007). It also suggests that politicians consider it a better strategy to buy rural political support directly from the mass of voters (peasants), rather than targeting resources towards local elites (large agricultural producers) in exchange of them acting as political brokers through patron client relations with their workers (Scott, 1972; Baland and Robinson, 2008).

## **1.8 Conclusion**

This paper provides evidence of how political institutions affect distributive politics. It studies the case of Colombia during a period of institutional change in the distribution of political power was broadened and state capacity increased. I analyse the effect of this

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<sup>62</sup> The Incentive de Capitalización Rural (ICR) is tied to credit, and thus there is no evidence of a cycle in ICR either. Note as well that the public bank (Caja Agraria) suffered a crisis during the 90s, making it unlikely that land patronage was replaced by credit patronage at the time.

<sup>63</sup> Unfortunately, I cannot test for this, as information on direct subsidy allocation at the municipality level before and after the institutional shift is not available.

<sup>64</sup> Comparing their size with a reference plot size (AUF) within each municipality. For details on this see the Annex.

shift on the strategic allocation of a targeted private benefit (land) across time. I find that the number of land allocations is systematically higher during electoral years, that is, there is a political land cycle. This cycle depends on the political institutions in place: after the institutional shift, its magnitude is reduced by half. These results evidence that electoral cycles are highly context dependent and rarely have fixed magnitudes and contents, as highlighted by Franzese and Jusko (2006).

I further show that despite the shift being a national level reform, the response to it was heterogeneous across space. Effective institutional change was stronger in core municipalities, corresponding to those located in central areas, in which initial institutions were more inclusive. This evidences that pre-existing institutions condition effective institutional change. In particular, where initial institutions were more inclusive, institutional change was enhanced, while where they were less inclusive, institutional change was limited. In line with this, I show that the reduction in the PLC was stronger in core areas. These results evidence the high degree of heterogeneity in distributive politics even within a country, as contextual conditions, and in particular, institutional conditions, vary across the territory. Future research relying on subnational data on micro level institutions is needed in order to advance our understanding of the territorial dimension of both institutions and distributive politics.

Regarding the mechanisms explaining the reduction in the PLC, the evidence points towards this being the result of a re-composition of distributive politics from targeted private benefits (in this case, land) towards the strategic allocation of public goods. I show that while the post shift period saw a decrease in the PLC, it saw an increase in the cycle of spending on public goods. This evidences that the allocation of public goods does not fully respond to programmatic considerations, but also to political ones. This is in line with research showing that public spending in Colombia is strategically targeted not only across time, but also across (Drazen and Eslava, 2010), and with the study of Thachil (2011) documenting how the BJP in India has been successful in winning the support of voters through the strategic provision of public goods in a context in which governments fail to universally provide them. Overall, the results show that improvements in institutional quality lead to a transformation of distributive politics, rather than to its disappearance. This result goes in line with those of the literature on clientelism highlighting its systemic resilience (Roniger, 2004) and its increasing use to pursue the delivery of public goods, as opposed to individual ones (Gay, 1998). It is worth noting that the political interference in public good spending, does not imply that there is a

negative impact on the welfare of voters. Indeed, one could expect this form of distributive politics to be less harmful than others such as private benefit allocations. In any case, the developmental implications of different distributive politics strategies require further research, ideally relying on micro (individual level) data.

I analyse the incentive and capacity effects likely explaining the re-composition of distributive politics. The incentive effect relates to political competition increasing the attractiveness of mobilizing voters via public goods. As these can appeal to a broader and more heterogeneous set of voters, they are an attractive strategy when the core base of a party is not sufficient to win elections (Diaz-Cayeros, Magaloni and Stévez, 2016). I show that consistent with the above, the decrease in the PLC is stronger in areas in which political competition increased the most after the introduction of multiparty competition.

I argue that the incentive effect is re-enforced through increases in political accountability and responsiveness derived from the introduction of local elections, direct democracy mechanisms and the strengthening of executive constraints. Consistent with the above, I show that the reduction in the PLC was only significant in municipalities with higher levels of accountability and transparency.

The effective re-composition of distributive politics requires not only the incentive effect, but also a capacity effect. This, especially as public goods are costlier and more complex to deliver than targeted private benefits. I find evidence supporting the capacity effect: the reduction in the PLC was stronger in municipalities with a higher capacity to allocate public goods, measured as a high efficiency in public good provision.

Future research is required to evaluate the electoral payoff of the PLC, as well as how patterns of service provision and the composition of distributive politics affect voting outcomes. For example, does it pay electorally to re-compose distributive politics from particularistic benefits to broad public goods?

Another area of future research is analysing how party politics mediate the effects of the political cycles and their response to institutional reforms. A particularly interesting aspect to analyse is how the introduction of local elections affects the political cycle through alignment between tiers of government. This would provide a better understanding of who pulls the levers of manipulation. Issues of government alignment have been shown to be relevant in explaining distributive politics (Corvalan, Cox and Osorio, 2018; Brollo and Nannicini, 2012).

Another area of research worth exploring is the demand-side of the composition of distributive politics. For instance, understanding when and why voters would change their type of demands for one type of good or the other. This area of research would profit from qualitative methods. Finally, further research could assess the impact of the institutional shift on actual service provision (which in developing countries does not necessarily map into expenditure) as well as on other governance and fiscal outcomes, including fiscal openness fiscal discipline and pro-spending biases (De Renzio and Wehner, 2017).



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## Annex 1

**Table 1.A1 Political institutions - before and after the shift towards more inclusive institutions**

	<b>Pre shift: Narrow distribution of power</b>	<b>Post shift: Broader distribution of power</b>
<b>Across Political parties</b>	<b>Closed bipartisan system</b>  Power sharing agreement between the two hegemonic parties, formalized in the National Front - Alternation of presidential power and division of parliament, ministerial posts and the judiciary	<b>Open multiparty system</b>  - Ease of requirements for the creation of new parties - Partial public financing for all parties and movements - Australian secret ballot
<b>Across societal actors</b>	<b>Restricted representative democracy</b>  Participation mainly through party structures, or informally through protest	<b>Participatory democracy</b>  Introduction of direct democracy mechanisms (popular consultations, referendums, revocation of mandate, open town meetings, municipal planning councils, Local Administrative Juntas, public committees)
<b>Across levels of Government</b>	<b>Political centralization</b>  President named Governors, who named Mayors	<b>Political decentralization</b>  Introduction of local democracy: Mayoral and Governor direct elections
<b>Across branches of Government</b>	<b>Power concentrated in the Executive</b>  - Appointed Justices - Ruled under state of siege - Legislative supermajority required to override economic bills	<b>Strengthening of executive constraints, the Judiciary and the Legislative</b>  - Creation of the Constitutional Court - Strengthening judicial oversight - Strengthening of the role of Congress
	<b>Pre shift: Weak and inefficient state</b>	<b>Post shift: Stronger and more efficient state</b>
<b>Fiscal capacity</b>	<b>Fiscal centralization and weak local capacity</b> - Central Government concentrated 80% of revenues. - Transfers to local governments 0,5% GDP - Municipalities had low fiscal autonomy	<b>Fiscal decentralization and increased fiscal capacity</b> - Established % income to be transferred to municipalities - Municipalities allowed to raise local taxes - Established % income to invest in public services.

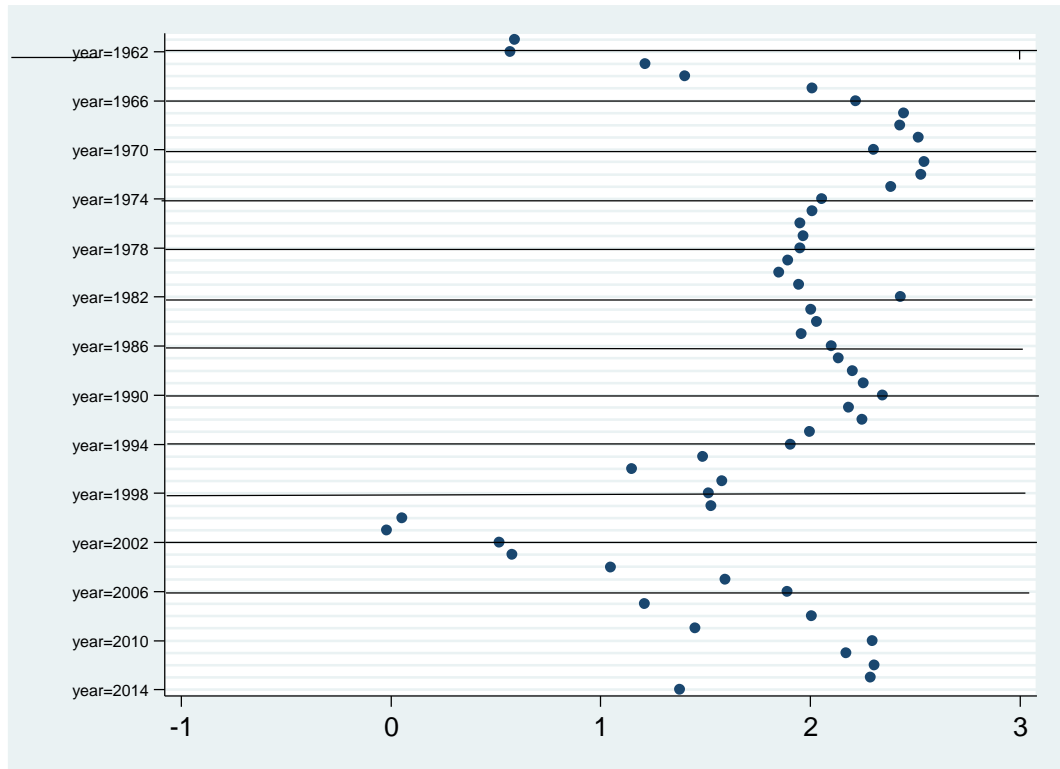


<b>Bureaucratic capacity</b>	<b>Centralized, weak bureaucratic capacity</b>	<b>Administrative decentralization and increased bureaucratic capacity</b>
	<ul style="list-style-type: none"> <li>- School enrollment rate 22%</li> <li>- Health coverage in rural areas: 10%</li> </ul>	<ul style="list-style-type: none"> <li>- Municipalities were given the responsibility for public service provision</li> <li>- Implementation of programs for increasing local administrative capacity (ESAP, PDI)</li> <li>- Formalization of procedures of meritocratic recruitment and promotion of civil servants</li> </ul>

**Table 1.A2 Summary Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Total Population	60,588	19,538	42,413	66	990,179
Poverty (UBN Index)	5,560	57.924	24.133	3.040	100
Abnormal rain (cms)	61,111	1.169	1.246	0	67.384
Bipartisan violence 1948-1953 (% mun)	61,050	0.133	0.340	0	1
Spanish colonial settlements	61,050	0.368	0.482	0.000	1
Distance to Department capital below department mean (% mun)	61,447	0.554	0.497	0.000	1
Average plot size	59,895	58.394	218.512	0.975	5,896
Land titles (1901-1960)	61,160	48.483	146.960	0.000	2,423
Land titles (municipality -year)	61,435	8.212	30.106	0.000	765
Large land titles (municipality -year)	61,435	1.126	6.430	0	228
Small land titles (municipality -year)	61,435	7.087	27.576	0	765
Local fiscal revenue (per capita) -COP	32,759	0.048	0.089	0	3.457
National transfers (per capita) - COP	32,759	0.076	0.132	0	10.652
Integral Performance Index (IPI)	60,335	63.717	9.737	28.173	85.782
IPI - Service delivery efficiency	60,335	50.669	9.899	16.852	79.564
OGI - Transparency and Accountability	60,280	53.744	15.849	2.250	91.350
Number of public organizations (per 100.000 inhabitants)	58,300	1.819	1.698	0	30.070
Education coverage 1964	47,467	0.337	0.151	0.045	1.454
Property tax per capita 1964 - COP	41,580	87491	332469	5.771	5393083
ENCP	14,183	2.112	0.776	1	5.586

**Figure 1.A1 Year Fixed effects coefficient plot**



**Table 1.A3 The Political Land Cycle –**

**Municipalities with low and high number of public agencies**

Dependent Variable: Number of Land Titles allocated (LT)		
<b>Public good provision efficiency</b>	<b>Low (1)</b>	<b>High (2)</b>
Pre Electoral year (E)	2.227*** [0.157]	1.819*** [0.305]
E* Post Shift	-0.712*** [0.199]	-1.456*** [0.299]
Log-Likelihood	-409422.27	- 92320.445
Observations	35,920	17,573
Number of Municipalities	663	322
Municipality and year FE	YES	YES
Municipal Controls	YES	YES

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. High is defined as being above the national median. Test of coefficient equality (E\*Post shift): P-value = 0.013.

**Table 1.A4 The Political Land Cycle –  
Municipalities with low and high increase in spending on public goods**

Dependent Variable: Number of Land Titles allocated (LT)		
<b>Increase in spending on public goods</b>	<b>Low (1)</b>	<b>High (2)</b>
Pre Electoral year (E)	1.993*** [0.158]	2.841*** [0.277]
E* Post Shift	-0.575*** [0.211]	-1.079*** [0.257]
Log-Likelihood	-388960.9	-124150.15
Observations	38,120	17,325
Number of Municipalities	700	320
Municipality and year FE	YES	YES
Municipal Controls	YES	YES

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. Increase in real per capita public good spending between pre and post period (pre period starting 1984 as information is not available for earlier years). High is defined as being above the national median. Test of coefficient equality (*E\*Post shift*): P-value = 0.049.

**Table 1.A5 The PLC – Excluding the elections in which both presidential and local races take place**

	<b>(1)</b>
Pre Electoral year (E)	2.172*** [0.141]
E* Post Shift	-0.709*** [0.179]
Log-Likelihood	-497812.92
Observations	53,323
Number of Municipalities	1,022
Municipality FE	YES
Municipal Controls	YES

Regressions estimated through a Fixed Effect Poisson model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. Estimated excluding 1990 and 1994 elections.

**Table 1.A6. Robustness to exclusion of outliers**

Dependent Variable: Number of Land Titles allocated		
	Excluding municipality outliers (1)	Excluding municipality- year outliers (2)
Pre Electoral year (E)	2.180*** [0.141]	2.167*** [0.143]
E* Post Shift	-0.703*** [0.178]	-0.685*** [0.178]
Log-Likelihood	-507085.07	-507220.76
Observations	55,503	55,345
Number of Municipalities	1,025	1,022
Municipality and year FE	YES	YES
Municipal Controls	YES	YES

Regressions estimated through a Fixed Effect model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks. Municipality year outliers are those over 600 titles per year, three outliers. Municipality outliers are those with average yearly land allocations of over 142, 18 outliers.

### **Additional results: The class dimension of distributive politics**

These results relate to who were the recipients of strategic land allocations, focusing on the class of recipients (small farmers or large agriculture producers). To identify this, I rely on information on plot sizes, taking into account that in rural areas, social classes are largely configured through type of land ownership. This allows to map plot type on to voter type: within a municipality, smaller titles are potentially allocated to small peasants, while larger titles are potentially allocated to large agricultural producers. Through this analysis I am able to study the class dimension of distributive politics, which as Golden and Min (2013) highlight, has received scarce attention in the literature, plausibly as identifying the class of a recipient is difficult (compared to, for example, identifying their ethnicity) <sup>65</sup>.

I identify small and large plots within each municipality. Each land allocation is categorized as either a *Small*  $LT_{i,t}$  corresponding to those  $LT_{i,t} < \overline{UAF}_t$  or as a

<sup>65</sup> Kloomp and de Haan (2013b) study differences in the political cycle of agricultural support among developed and developing countries, arguing that the differences reside in that in the former, agricultural producers are a reduced and powerful interest group, whereas in the latter, farmers are the mass of voters. This is indirectly, a study of class and distributive politics. A related work studies the differences in public good vs private benefit provision in Nepal as a function of land tenure structure. They find that landed elites (patrons) are favoured with private goods, whereas tenants or workers (peasants) and favoured with public goods (Joshi and Mason, 2011).

Large  $LT_{i,t}$  if  $LT_{i,t} > \overline{UAF_i}$ . The UAF (*Unidad Agropecuaria Familiar*) is a reference plot size, estimated based on agro-ecological conditions in each area<sup>66</sup>. Table 18 shows that the PLC is heterogeneous across type of plot/beneficiary. Before the shift to more inclusive political institutions, the PLC for small titles was significantly higher than the PLC for large ones. After the shift, the small PLC is reduced by half, while the large PLC becomes negative.

**Table 1.A7 – The PLC for small and large titles**

Dependent variable:		
	Small titles (1)	Large titles (2)
Pre Electoral year (E)	2.499*** [0.173]	1.267*** [0.186]
E* Post Shift	-0.570*** [0.183]	-2.748*** [0.242]
Log-Likelihood	-475834.37	-68130.261
Observations	54,853	30,584
Number of Municipalities	1,013	563
Municipality FE	YES	YES
Municipal Controls	YES	YES
Mean Land Titles	7.087	1.126

Regressions estimated through a Fixed Effect model. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Controls include lagged population and lagged rainfall shocks.

That the PLC is stronger for small allocations is consistent with standard theories of distributive politics arguing that politicians favour small allocations due to their cost effectiveness (Dixit and Londregan, 1996; Brusco, Nazareno and Stokes, 2004; Kitschelt and Wilkinson, 2007). It also suggests that politicians consider it a better strategy to buy rural political support directly from the mass of voters, rather than targeting resources towards local elites (large agricultural producers) hoping they mobilize their workers votes, acting as political brokers through patron client relations (Scott, 1972; Baland and Robinson, 2008). Targeting the PLC towards small farmers could also result from a “clientelistic social inclusion” as it was called at the time (Urrutia Montoya, 1990). In addition to this, targeting the peasant class could serve for appeasing political opposition, essential in a context of revolutionary threat (Lopez-Urbe, 2018) and posterior guerrilla threat (Albertus and Kaplan, 2012).

<sup>66</sup> Technically defined as the amount of land which is needed for a household to generate working income plus a small profit. I use the municipality average of UAF. Data comes from municipal panel of CEDE. For a small number of municipalities with missing information, the department average is imputed.

## Chapter 2

### Increasing Access to Agricultural Credit: The Heterogeneous Effects of Collective Action

Co-authored with Jean Paul Faguet<sup>67</sup> and Maria del Pilar Lopez-Uribe<sup>68</sup>

*Collective action allows individuals to overcome market and state failures, something particularly relevant in the rural sector and in a highly imperfect market such as agricultural credit. This paper employs data on over 2,3 million rural producers in Colombia as well as novel subnational panel data for over 15,000 municipality-year observations to analyze the relation between collective action and access to agricultural credit. We find that collective action in the form of Rural Producer Organizations (RPOs) only increases the likelihood of an individual accessing agricultural credit, and furthermore, it increases access to credit at the aggregate (municipality level); that is, there is a positive general equilibrium effect, rather than a crowding-out of credit between RPO members and non-members. We also find that the effect is heterogeneous according to the type of credit (source and size). For credit granted to small farmers, there is an aggregate positive effect, but only via access to public credit. For credit granted to big farmers, the effect is also positive, but this time, through private credit. In contrast, for medium-scale farmers, there are no aggregate increases in access to credit. The heterogeneity in the results appears to be driven by the structural segmentation of the credit market across farmer type and sources, which is replicated, rather than counteracted by the collective action effect. This evidences how the potential impact of collective action on development outcomes is dependent on contextual conditions.*

**Key words:** rural financial development, agricultural credit, credit constraints, collective action, rural producer organizations, Colombia,

#### 2.1 Introduction

During the past three decades, researchers and policy makers have become increasingly interested on how social relations and social organizations contribute to development. One aspect that has received particular attention is collective action (CA), or action taken together by individuals pursuing a common objective. Through collective action, individuals are able to address problems and achieve outcomes they could not achieve if they were acting on their own, or if the state or the market were acting solely (Ostrom, 1990, Bowles and Gintis, 2002; Putnam, 1993). Collective action is particularly relevant

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in the rural sector, as through it individuals and communities overcome market and state failures that arise because of structural conditions including the dispersion of population and markets, the seasonality of production, the vulnerability to weather conditions and the prevalence of weak property rights (ILO, 2015).

Collective action can materialize in different forms. In rural areas, one key and common materialization are Rural Producer Organizations (RPOs). RPOs are organizations such as agricultural cooperatives and associations, in which farmers voluntarily participate and invest time, effort and resources to improve their production and commercialization opportunities. There is evidence that RPOs increase production, efficiency and income (Desai and Joshi, 2014; Verhofstadt and Maertens, 2014; Vandeplas et al. 2013)<sup>69</sup>. Studies have also shown that RPOs constitute information hubs through which farmers share information and best practices (Abebaw and Hail, 2013; Markussen and Tarp, 2014), and show that through vertical and horizontal integration, these organizations ease access to input and output markets (Verhofstadt and Maertens, 2014; Conley and Udry, 2003; Bebbington, 1997; Narrod et al. 2009).

This paper analyses whether in addition to increasing access to input and output markets, collective action can increase access to the financial market, in particular, to agricultural credit. Previous studies provide evidence for the positive impact of agricultural credit (i.e. credit used for productive purposes) on outcomes including production, productivity and poverty (Ayalew, Deininger and Duponchel 2014; Conning and Udry, 2007; Burgess and Pande, 2005). Despite the above, financial access throughout the developing world remains limited (Guirkingner and Boucher, 2008), highlighting the relevance of exploring alternative ways to increase access to credit.

We study the case of Colombia and rely on micro-level data for over 2,3 million farmers to estimate the individual level effect of collective action measured as RPO membership on access to agricultural credit. We find that this form of collective action increases the likelihood of a farmer accessing credit by 2,5 times. This result is consistent with studies showing that individual access to credit increases through social relations, measured as participation in community meetings and vertical informal social networks (Dufhues et al. 2013; Okten and Osili, 2004), participation in farmer and women unions (Markussen

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<sup>69</sup> The above has encouraged policy makers in different countries to actively promote and support RPOs, as is the case of Senegal (Arcand and Wagner, 2016), South Africa (Lyne and Collins, 2008) and Colombia (Gomez et al. 2016).

and Tarp, 2014)<sup>70</sup> or as trust and social collaterals (Karlan, 2007; Cassar, Crowley and Wydick, 2007).

That collective action increases access to credit for some individuals does not imply that there are positive general equilibrium effects. CA could increase access for just some farmers (i.e. RPO members) while crowding-out resources available for others (i.e. non-members). Therefore, the aggregate developmental impact on local financial access is unclear. A first contribution of our paper is exploring the general equilibrium effects of collective action, analysing its impact on aggregate (municipality level) credit provision. For this analysis, we employ novel data on RPO creation and credit allocation for over 1.100 municipalities during a 15-year period, and estimate a Fixed Effects model. Through a “one-country, Large-N analysis” (Faguet, 2012) we are able to analyse the aggregate and dynamic impact of collective action while controlling for historical, institutional and cultural factors that typically bedevil inferences made on small samples and on cross-country or cross-section observations.

Our results provide evidence of positive general equilibrium effects. Collective increases access to credit at the local level, on both the extensive margin (total number of credits) and the intensive margin (total value of credits). This points towards the existence of positive spillover effects (from RPO members to non-members), at least in contexts in which the supply of credit is not fixed. We then disaggregate data by credit source (public and private banks) and by recipient type (big, medium and small farmers), and find that the aggregate effect of collective action is heterogeneous. For small farmers, it is positive, but only via increased access to public credit. For big producers, the effect is also positive, but this time through access to private credit. In contrast, the effect is not significant for medium-scale farmers.

Our results point towards this heterogeneity being explained by contextual conditions that bind the effect of collective action. In this particular case, the binding condition is the structural segmentation of the credit market across farmer type and sources. Commercial banks tend to favour credit for big farmers as fixed transaction costs and risk are perceived as lower. In turn, public banks tend to favour credit for small farmers following their dual mission of allocating financial resources and of promoting rural development (i.e. by targeting vulnerable population). Under this situation, medium-scale farmers are left in-

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<sup>70</sup> While related, this study provides restricted evidence, as it relies on a survey of a small number of households (2.000) and in a particular area (12 provinces) in Vietnam.



between, with restricted access to credit. The results in this paper show that the effect of collective action replicates, rather than counteracts this sorting of credit. Analysing heterogeneous effects is a second contribution of our paper. As noted in Banerjee et al. (2015), the literature on access to credit does not provide strong evidence on distributional effects<sup>71</sup>.

A third contribution of the paper is exploring the mechanisms through which collective action increases access to credit. We analyse the effect of RPO membership on both the demand side (i.e. the likelihood of credit request) and the supply-side (i.e. likelihood of credit approval conditional on request). We find that the demand side effect is two times stronger than the supply side one. These mechanisms are further explored in Benson (2020) through a mixed method analysis nesting the quantitative results presented in this paper, with qualitative evidence gathered through four case studies and over 60 semi-structured interviews. Benson (2020) finds that RPO membership increases the supply of credit through several mechanisms. First, as it enables farmers to access special credit lines (associative credit) offered by banks specifically to RPOs and under preferential conditions. Second, as RPOs provide in-house credit to their members. And third, as RPO membership increases the likelihood of banks approving individual credit requests by constituting signals of both farmer quality and project quality, increasing creditworthiness and reducing problems of imperfect and asymmetric information. The author also finds that collective action increases the demand for credit as organized farmers are able to engage in new, larger and more profitable projects which require investment. The increased profitability of projects relates to RPOs easing access to quality inputs, technical assistance, commercialization contracts and government support. In addition to this, the author finds that CA increases the demand for credit through reductions in transaction cost constraints, as through RPOs farmers access information about credit opportunities. Lastly, RPOs reduce risk constraints, as they constitute a safety net, for instance, providing emergency loans used to pay for formal credit obligations in situations of low liquidity. Overall, these results show that through developing rural associativity, it is possible to develop rural financial markets.

The remainder of this paper is structured as follows. Section two describes the conceptual framework. Section three discusses the context of Colombia, section four provides details

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<sup>71</sup> Some studies have analysed differences between formal and informal sources of credit (Giné, 2011, Boucher and Guirkinger, 2007, 2008), but few focus on heterogeneous effects within formal sources (i.e. public and private credit) and on heterogeneity in recipient type.

on the data, and section five on the empirical strategy. The results are presented in the sixth section, and section seven includes the robustness tests. Section eight discusses the mechanisms, and the last section concludes.

## **2.2 Conceptual framework**

### **2.2.1 Collective Action and rural development**

Social relations and the collective action that they enable affect development outcomes, something particularly relevant in the rural sector, where market and state failures are salient. Previous studies show for example, that collective action allows farmers to face adverse climatic conditions and achieve better than average harvests (Uphoff and Wijayaratna, 2000). In her seminal work, Ostrom (1990) shows that it is through collective action that rural communities most effectively manage common resources, and that voluntary collaboration and mutual enforcement are viable strategies for promoting development.

Collective action can materialize in informal and formal ways. We focus on a formal, common and key materialization of collective action in rural areas: Rural Producer Organizations<sup>72</sup>. Empirical studies carried out in Latin America, Africa and Asia show that RPOs have a positive impact on income, production and efficiency (Desai and Joshi, 2014; Vandeplas et al. 2013; Fisher and Qaim, 2012). These positive effects arise, among others, as RPOs allow the exploitation of economies of scale (Nilsson, 2001; Valentinov, 2007), ease the adoption of technology, improved inputs and new crops (Verhofstadt and Maertens, 2014; Conley and Udry, 2003), and increase the sharing of information and best practices (Abebaw and Hail, 2013; Conley and Udry, 2003). There is evidence that RPOs increase access to markets (Bebbington, 1997; Narrod et al., 2009) and strengthen the links between local communities and the government (Markussen and Tarp, 2014; Bebbington and Perreault, 2003).

Despite these benefits, only some farmers join RPOs. This can result from a lack of information about the potential benefits of these organizations, as well as from the costs of participation, which can be higher than the expected return. Benson (2020) finds that farmers restrain from joining RPOs because they are not able to pay for membership fees and perceive high travel and opportunity costs of attending meetings (e.g. stopping to

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<sup>72</sup> In the Colombian case, census data shows that RPOs are the most common social organization in rural areas. Other organizations include women, sports, political and civic organizations.

work in the crops or household activities). There are also non-trivial coordination and transaction costs, including negotiating divergent interests among members, making collective decisions, monitoring compliance with rules and solving conflict (Vitaliano, 1983; Ostrom, 1990). These costs evidence that collective action is not a universal or cost-free alternative for enhancing rural development. Understanding the potential of collective action as a developmental tool requires gaining a more in-depth understanding of the nature of collective action organizations, of the heterogeneous effects they generate and on how their impact is conditioned by the context.

### **2.2.2 The imperfect agricultural credit market**

Accessing agricultural credit is key for rural development. As previous evidence shows, access to credit lowers poverty and increases productivity, output and income (Burgess and Pande, 2005; Echavarria et al. 2017; Ayalew, Deininger and Duponchel, 2014). Despite this, most farmers in the developing world continue to have limited or no access to formal credit. Banerjee and Duflo's (2006) study of 13 developing countries shows that only 6% of the funds that poor households borrow come from formal sources. In Colombia, only 11% of farmers report accessing credit in a given year (CNA, 2016). In addition to this, as discussed in Giné (2011) farmers who do access credit, usually receive fewer resources than those requested. As such, they remain credit constraint at the intensive margin.

While microfinance has introduced new credit opportunities into rural areas, microfinance institutions do not provide the full range of products needed by vulnerable households. Furthermore, the impact of microcredit on developmental outcomes like poverty remains uncertain (Banerjee et al. 2015; United Nations, 2006). Moreover, formal agricultural credit (i.e. credit granted by commercial and public banks for productive purposes) offers better conditions: lower interest rates, longer terms and larger credits (Giné, 2011; Guirkinger and Boucher, 2008). For instance, in Colombia, a recent survey shows that 92% of farmers prefer to finance their investment through credit from banks or cooperatives rather than through the more expensive informal sources (Econometría and M. Consultores, 2014).

The agricultural credit market is characterized by being imperfect due to information and enforcement problems that lead to moral hazard and adverse selection (Conning and Udry, 2009; Boucher et al. 2009). Information is costly to access in rural areas where population and production units are dispersed, and physical and technological

infrastructure is precarious. Moreover, when financial institutions have access to information (e.g. on the experience of the producer or the return of productive project to be financed), the information does not provide certainty, as output and revenue are vulnerable to weather conditions and to fluctuations in international commodity prices and exchange rates. Furthermore, most farmers lack the human capital required to go through the credit application process, which requires filling out forms and certificates. State failures also affect the rural financial market. One example is weakness of property rights, which make assets like land unsuitable for collateralization (Conning and Udry, 2005, ILO, 2015). The imperfections of the credit market have detrimental effects for development, as lacking access to capital prevents individuals from undertaking desired productive investments (Boucher et al. 2009). Empirical evidence shows for instance, that credit constraints in Peru reduce the value of agricultural output by 26% (Guirkinger and Boucher, 2008).

Another characteristic of the rural credit market is that it is highly fragmented. This means that different types of farmers (big, medium, small) are sorted across different sources of credit. This sorting occurs not only across formal and informal sources, but also within formal ones (e.g. across public and private credit) (Giné 2011, Conning and Udry, 2005). Private banks tend to favour big farmers, as the fixed approval and disbursement costs are lower for high-value credits, and as large produces are perceived as more creditworthy, among others, because they are engaged in productive projects which are intensive in fixed capital that can be used as collateral, reducing credit risk (United Nations, 2006). Our fieldwork results further show that incentive schemes for credit analysts in private banks generate a bias towards allocating high-value credits, as their goals are set on the value of credit resources allocated, rather than on the number of credits allocated. Some private banks even set minimum credit sizes.

On the other hand, public banks tend to favour credit allocations towards small farmers. This stems from normative considerations (i.e. the mission of public banks is not only being financial intermediaries, but also promoting rural development) as well as from public regulations (e.g. subsidized interest rates) favouring small farmers. This sorting of credit more broadly reflects the typical segmentation of agricultural production between small subsistence producers and large agroindustry exporters.

The fragmentation of the credit market has relevant implications for development. First, as the available financing conditions (requirements and interest rates) affect a farmer's decision on how, what and how much to invest and to produce (Conning and Udry, 2005).

Second, as different sources offer different additional benefits (e.g. complementary guarantees, payment schemes), conditioning the developmental impact of credit in each case.

### **2.2.3 Collective Action and Agricultural credit**

Can social relations, and in particular, collective action, help farmers and communities access agricultural credit? The literature on microfinance provides evidence on how social relations affect informal credit dynamics. Studies show, for instance, that individuals with stronger social connections to other microfinance group members have higher repayment rates and higher savings (Karlan, 2007). There is also evidence that trust and trustworthiness arising from social relations increase group loan repayment (Cassar, Crowley and Wydick, 2007; Karlan, 2005). Fewer studies have analysed the impact of social relations on formal agricultural credit. The studies of Dufhues et al. (2013) and Guirkingner and Boucher (2008) show that social networks (vertical and between neighbours) reduce credit constraints, and there is evidence that participation in village committees and social organizations can increase the likelihood of an individual accessing credit (Okten and Osili, 2004; Markussen and Tarp, 2014).

That participation in collective action organizations increases access to credit at the individual level does not imply that there are positive general equilibrium effects. This, as credit granted to RPO members could crowd-out credit available for non-members. General equilibrium effects will depend on how flexible the supply of credit is, as well as on whether there are positive spillover effects of collective action from RPO members to non-members (e.g. diffusion of information, imitation and capacity transfer from members to non-members or offering commercialization opportunities to non-members). We address this issue in our analysis. Before discussing the methodology employed to do so, we present information on the setting of the study.

## **2.3 Setting**

### **2.3.1 The agricultural credit market in Colombia**

Increasing access to credit is a key policy challenge in Colombia. Not only to increase the economic growth of the agricultural sector, which has been below 2% during the last 20 years (Junguito, Perfetti and Becerra, 2014), but also to reduce rural poverty of around 40% (DANE, 2018). Despite its developmental potential, only a small share of Colombian farmers' access agricultural credit. According to the agrarian census of 2013,

only 11% of rural producers access credit in a given year, while Cadena and Quintero (2015) estimate the rate of financial access in 25%, being below other countries in the region.

Credit allocation has significantly increased during the last decade: the number of credits granted per year increased by 6 times between 2002 and 2015, while the real value of these increased by 25 times. Credit is allocated throughout the whole country (see Maps 2.A1 and 2.A2 in Annex) <sup>73</sup>. The average size of credits varies significantly by farmer type. For small farmers, it is \$8 million COP, for medium ones \$60 million COP and for big ones \$526 million COP<sup>74</sup>. During the period of study (2002-2015) credit allocated to small farmers represented 84% of all credits (and 23% of total resources). This is consistent with the fact that 89% of all farmers in Colombia are small. Credit to medium-scale farmers represented 14% of all credits (and 34% of resources), while credit for big producers represented 2% of credits (and 43% of resources)<sup>75</sup>. Figure 2.1 shows the increase in the value of credits granted during these years (panel A), especially to big farmers, as well as the increase in the number of credits (panel B), especially to small farmers. It also evidences that the number of credits granted to medium producers (and their value) have not increased significantly.

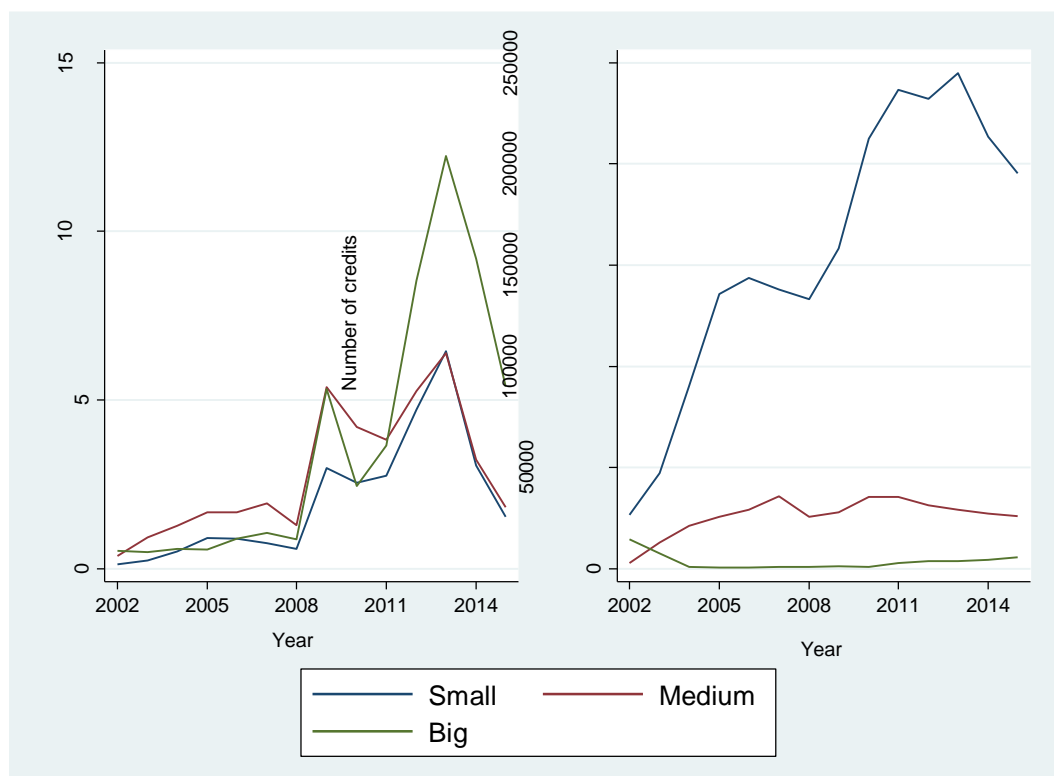
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<sup>73</sup> Note that there exist no mechanisms of credit targeting in Colombia to particular regions or types of farmer. We analyse whether there is evidence of a political budget cycle in the provision of credit by comparing credit allocated in electoral and non-electoral years, and find no evidence for this.

<sup>74</sup> Credit is categorized according to size of farmer, which is defined by FINAGRO according to the value of capital owned. Small farmers are those whose capital is worth less than \$93 million COP (USD 34.370), and medium size farmers are those whose capital is worth less than \$3,467 million COP (USD 1.28 million). These differences are associated with the type of product produced by each type of farmer, which have different investment needs. For example, big producers tend to produce sugar, rice and palm oil, which require high capital investments.

<sup>75</sup> While credit resources are highly concentrated among big farmers, their access rate is lower than that of small and medium farmers (12% vs. 9%) (CNA, 2016), suggesting that big farmers are able to self-finance.

**Figure 2.1 Real value and number of credits granted by type of producer**



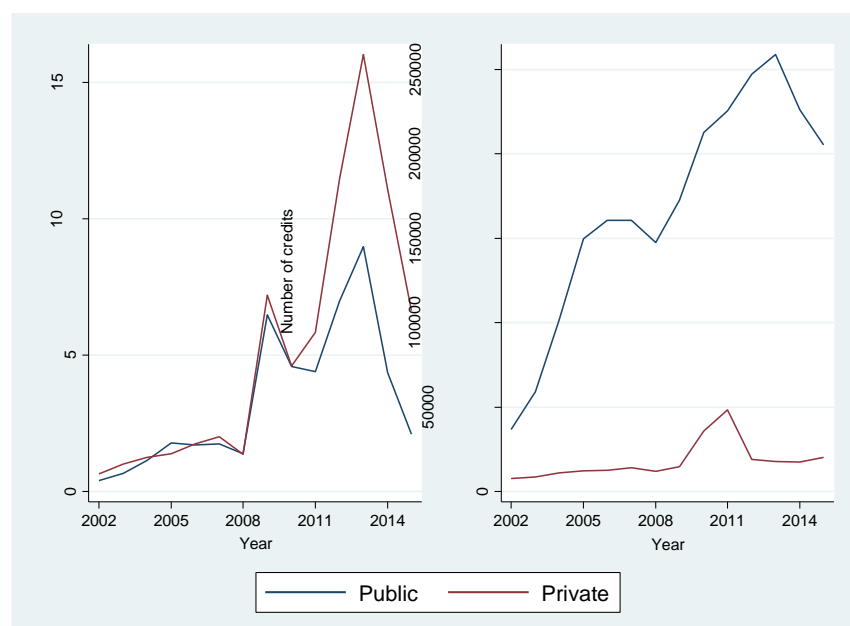
Source: Finagro

The majority (65%) of credits are granted by the public bank, while private banks allocated 20% of all credits<sup>76</sup>. Private credits are on average larger than public ones, although interest rates are similar as the government regulates both (e.g. setting interest rate ceilings)<sup>77</sup>. The processing time and requirements do vary, what affects credit demand, as processing time and closeness to bank branches drive the preference of farmers over sources of credit (Benson, 2020). Figure 2.2 shows the dynamics of credit allocation by source. It evidences that while the increase in the value of credits (total resources) was higher for private credit, the increase in the number of credits allocated was higher for public credit.

<sup>76</sup> Commercial banks in Colombia are forced by law to invest a fixed share of their check and savings accounts in TDAs (Agricultural Development Titles). These resources are managed by Finagro, a second level bank, and are transferred to the public Agricultural Bank (Banco Agrario) to finance its credit allocations. Commercial banks have the alternative of granting agricultural credits directly, which substitute for the forced investment requirements. Public loan guarantees are another important policy tool, covering 88% of credits and acting as an incentive for credit supply and demand. Private credit includes agricultural microcredit granted by financial institutions (starting 2015).

<sup>77</sup> Interest rate ceilings favouring small farmers (interest rates: 12% vs. 13% for medium and 14,6% for big). This aims at counteracting the natural tendency of the market to charge higher interest rates for small loans (Banerjee and Dufflo, 2010). The market interest rate for small credits is lower in the public bank than in commercial banks, while for larger credits, banks can offer more competitive interest rates.

**Figure 2.2 Real value (panel A) and number (panel B) of credits granted by source**



Source: Finagro

The remaining share of credits are granted by financial and credit cooperatives<sup>78</sup>. It is worth noting that financial cooperatives differ from agricultural cooperatives. The first are solely financial institutions and operate similarly to banks, while the second are aimed at collective production and/or commercialization. It is also worth noting that cooperative credit constitutes a small share of all credits and that it offers less beneficial conditions than public or credit banks. This, as interest rates are not regulated, and as the geographical presence of financial cooperatives is reduced.<sup>79</sup>

### 2.3.2 Collective action in rural Colombia

Little is known about RPOs in Colombia, to the extent that we are the first study to calculate the number of existing organizations (for details on the calculation, refer to the data section). We build a database relying on novel data on RPOs, and find that between 2002 and 2015, over 27,000 RPOs were created and formally registered<sup>80</sup> throughout the country (see Map 2.A3 and 2.A4 in the Annex). We find that exit rates are much lower

<sup>78</sup> Estimation based on data from the Agricultural Census, as cooperative credit under Finagro conditions (and thus included in Finagro data) constitutes a marginal share.

<sup>79</sup> For a detailed description of credit conditions and benefits across sources, see Table 2.A1 in the Annex.

<sup>80</sup> RPOs register with the Chambers of Commerce. The registry process is not costly, but requires members to fill out forms, establish their own statutes, among others.



than entry rates: the average number of RPOs cancelled per year is equivalent to 5% the average number of RPOs created<sup>81</sup>.

RPOs tend to focus on the production of a particular product, the most common being coffee, fruits, cocoa, cattle ranching and milking<sup>82</sup>. Our fieldwork results evidence that RPOs operate at a very local level (*vereda*), and that RPO members are usually similar in size and agricultural activity. As discussed in Benson (2020), there is a high heterogeneity in the functioning and success of RPOs, what is related to the way in which the organizations emerge: successful RPOs tend to be created organically, as bottom-up initiatives with production and long-term objectives. In contrast, less successful RPOs are created inorganically, as short term vehicles for accessing sporadic benefits offered by top-down external sources (e.g. accessing resources from a public programs targeted towards organized farmers).

According to the agrarian census, 10% of rural producers in Colombia are members of RPOs. Participation rates across farmer size are similar: 10% for small, 11% for medium and 12% for large<sup>83</sup>. As further analysis, we estimate a Logit model of the predictors of RPO participation, and find that the main predictors of RPO participation are having commercial activity, receiving technical assistance and having agricultural machinery<sup>84</sup>.

Regarding the relation between credit allocation and collective action, in Figure 2.3 we show credit dynamics separately for two types of municipalities based on their levels of collective action. Collective action is measured as the number of RPOs per capita in a municipality, and high (low) refers to being above (below) the national average. The figure evidences that municipalities with high levels of collective action have higher access to credit (both on the extensive and the intensive margin) and that the difference relative to low collective action municipalities increases throughout time. This provides descriptive evidence of the relation that will be formally analysed in the next sections.

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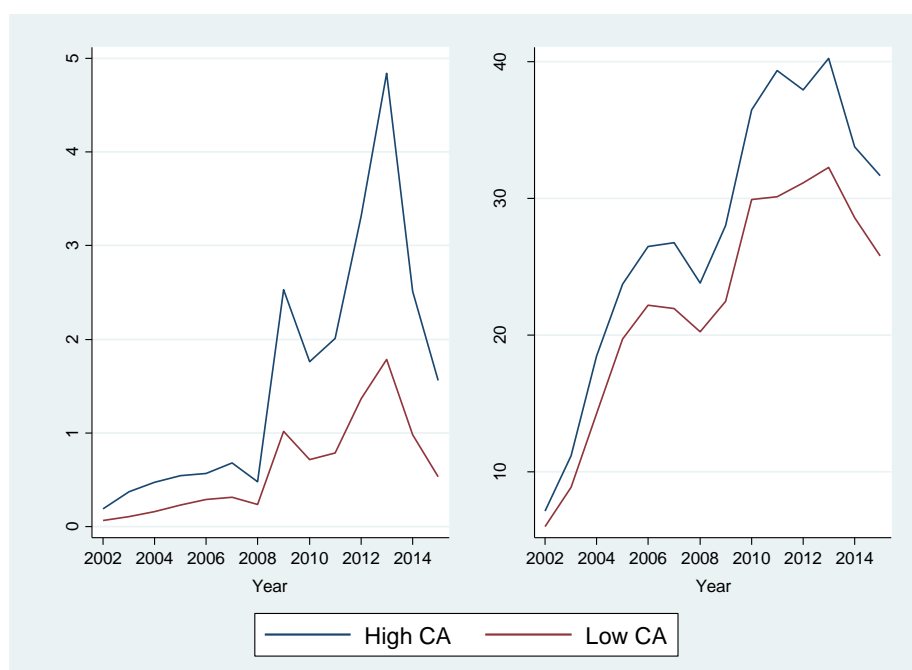
<sup>81</sup> There can be underreporting of cancellations. However, RPOs are legally required (by Decree 019 of 2012) to update their registry annually, and thus we have information on the last update date, allowing us to identify whether RPOs are active.

<sup>82</sup> The categorization of products is based on the RPOs that include the product in the organization's name (around a third of the RPOs). Based on individual level data from the Census, we find that 69% of members engage in agricultural commercial activity, 19% in livestock production, while fishery and forestry account for less than 3%. There are no significant differences in the rate of RPO participation according to activity.

<sup>83</sup> Note that these size categories are not comparable to the small, medium and big farmers' credit categories, which are defined based on capital, not plot size.

<sup>84</sup> Farmers do not report accessing credit as a principal reason for joining RPOs Results available upon request

**Figure 2.3 Average value and number of credits allocated, by level of collective action**



Source: Author's calculations based on information from RUES, INCODER and CEDE.

## 2.4 Data

The individual level analysis is based on census data for over 2,3 million rural producers<sup>85</sup>. Data comes from the Agrarian Census of 2013, and includes self-reports of RPO membership, access to credit, farmer age, size (based on plot size), education level, access to health, ethnic background, ownership of agricultural machinery and access to technical assistance.

The municipality level analysis relies on secondary data from various sources. Information on credit comes from Finagro and includes the total number and value of credits granted per year at the municipality level. Credit data is disaggregated according to farmer type (small, medium and big<sup>86</sup>), and source (public bank, private banks). It does

<sup>85</sup> Census data refers to agricultural productive units, UPA (which is the unit of analysis in the CNA). UPA is the unit of organization for production under one producer's charge. Only 4% of UPA are composed by more than one household. For simplicity, we use the term producers instead of UPAs.

<sup>86</sup> Finagro classification based on the value of assets of the farmer. Small farmers are those whose capital is worth less than \$93 million COP (USD 34.370), and medium size farmers are those whose capital is worth less than \$3,467 million COP (USD 1.28 million).

not include credit granted by financial cooperatives, as this information is not reported<sup>87</sup>. Data on the number of RPOs per municipality is novel. We built it relying on microdata from the Unique Registry of Solidarity Enterprises (RUES) from Confecamaras, in which all social organizations are required to register by law<sup>88</sup>. Relying on an algorithm combining organization name, type and economic activity, we identified 27.000 RPOs, from a universe of 260.000 social organizations.

Data on local economic and social conditions was obtained from the municipality panel of the Centre for Research in Economic Development (CEDE). Information on homicide rates comes from the Ministry of Defence. Data on intragovernmental transfers and local tax revenues comes from DNP. Data on weather conditions comes from IDEAM, based on which we built a variable of weather shocks (measuring strong deviations from historical month-municipality average rain levels). Summary statistics are presented in Table 2.A2 in the Annex.

## 2.5 Empirical strategy

This section details the econometric strategy for analysing the relation between collective action, in the form of RPOs, and access to agricultural credit. The individual level analysis is based on a Logit model. The dependent variable is a dummy indicating whether an individual has access to credit. The independent variable is a dummy indicating whether a farmer is member of an RPO. Socioeconomic controls include age, gender, level of education, access to machinery, access to technical assistance, and participation in other social organizations.

The municipality level analysis is based on a fixed effect panel model for 1,100 municipalities between 2002 and 2015, as described in Equation 2.1:

$$Y_{i,t} = \beta_0 + \beta_1 X_{i,t-1} + \beta_2 CA_{i,t} + \mu_i + \delta_t + \gamma_{d,t} + \epsilon_{it} \quad (2.1)$$

The dependent variable  $Y_{i,t}$  corresponds to the number of credits granted per capita<sup>89</sup> in municipality  $i$  during year  $t$ . This outcome variable measures access to credit at the

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<sup>87</sup> It does include credit granted by financial cooperatives regulated under Finagro conditions, but this is a marginal share of credits. There is no information on credit granted by suppliers, money lenders or other sources either.

<sup>88</sup> Social organizations in Colombia must register in the RUES (with a cost of 0.7% of their patrimony), and update their registry annually. RPOs have incentives to do so, as this is required if they want to for example, access credit or benefit from a public program. Nonetheless, there can be underreporting of RPOs created.

<sup>89</sup> For the dependent and independent variables, per capita refers to rural population

extensive margin. As a second outcome variable, we measure access to credit at the intensive margin, with  $Y_{i,t}$  being the real value of credits allocated per capita in a municipality. The independent variable is  $CA$  (*Collective Action*), measured as the number of RPOs per thousand rural inhabitants in municipality  $i$  in year  $t$ . There is no panel data for the number of farmers participating in RPOs. This information is only available for the census year. As a robustness test, we run a cross section analysis with this alternative measure<sup>90</sup> of  $CA$ .

Equation 2.1 includes a vector ( $X$ ) of observable municipality characteristics that vary in time and affect credit provision. These include transfers from the central and departmental government, controlling for public investment in the agricultural sector and others, which can affect credit dynamics. We also include local tax revenues to control for the dynamism of the local economy, accounting for instance, for price shocks that affect municipalities differently. We control as well for the number of homicides per capita as a measure of insecurity, conflict and risk (this variable also relates to the strength of state presence). Finally, we control for weather shocks which can directly affect the demand for investment. The last term in the equations is  $\epsilon_{it}$ . The standard errors are clustered at the municipality level to control for potential serial and spatial correlation.

The specification includes a municipality fixed effect ( $\mu_i$ ) that controls for time invariant municipality characteristics, for example, distance to the capital city (market integration), trust, entrepreneurial culture and other underlying municipality characteristics. This fixed effect also controls for variables that do not vary significantly over short periods of time (e.g. land quality, inequality, education levels, strength of economic institutions). We include as well a time fixed effect ( $\delta_t$ ) controlling for aggregate variations that occur during a given period and affect all municipalities (e.g. macroeconomic cycles). Finally, we include a department-time fixed effect ( $\gamma_{r,t}$ ) which controls for aggregate variations that occur during a period and affect all municipalities within a department (e.g. a natural disaster or a department economic shock). To account for further endogeneity concerns, in the robustness test section, we estimate the results relying on two additional models (differences in differences).

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<sup>90</sup> The number of RPOS does not reflect RPO size or success. However, there is no consensus on the impact of RPO size on RPO success: while big RPOs generate benefits to more farmers, the costs of collective action and the incentives to free ride might be higher.

## 2.6 Results

### 2.6.1 Individual level analysis

The results of the Logit model are presented in Table 2.1. They evidence that collective action, measured as RPO membership, increases the likelihood of a farmer demanding a credit by 2,5 times. The result is robust to the inclusion of controls (Column 2). We also estimate the effect on the likelihood of credit supply conditional on demand<sup>91</sup> (Columns 3 and 4). The coefficient for the supply side effect is positive and robust, but the effect is half the size (1,2 times) of the demand-side effect. The results further evidence that RPO membership is a strong predictor of access to credit: the magnitude of its effect is larger than that of other farmer characteristics, including gender, age, ethnicity, education, owning agricultural machinery, participating in other social organizations or accessing the subsidized health system (a proxy for poverty).

**Table 2.1 Logit model – Individual access to credit**

VARIABLES	Probability of credit demand		Probability of credit supply conditional on demand	
	(1)	(2)	(3)	(4)
RPO member	0.927*** [0.029]	0.833*** [0.030]	0.177*** [0.032]	0.171*** [0.033]
Received Technical Assistance	0.870*** [0.029]	0.752*** [0.026]	0.301*** [0.029]	0.265*** [0.029]
Commercial activity	1.497*** [0.032]	1.050*** [0.031]	0.632*** [0.033]	0.523*** [0.047]
Owns agricultural machinery	0.597*** [0.024]	0.482*** [0.024]	0.143*** [0.028]	0.144*** [0.030]
Community organization member	0.052 [0.051]	0.094* [0.054]	-0.159*** [0.051]	-0.145*** [0.056]
Male		0.298*** [0.017]		0.077*** [0.026]
Above average age		-0.102*** [0.012]		-0.213*** [0.021]
Finished primary		0.005 [0.016]		-0.225*** [0.023]
Private health		-0.245*** [0.024]		-0.006 [0.030]
Ethnic background		-0.445*** [0.115]		-0.033 [0.115]
Constant	-3.863*** [0.045]	-3.338*** [0.045]	1.298*** [0.044]	1.514*** [0.054]

<sup>91</sup> There are some differences in the number of credits approved reported by Finagro and by the census data.

Observations 2,259,298 1,068,983 250,230 155,910

Robust standard errors in brackets, clustered at the municipality level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Results are based on self-reports of credit request and access during 2013. The number of observations for the likelihood of credit supply conditional on demand is lower, as it is estimated only for producers who requested credit. The estimates in columns 2 and 4 have lower number of observations given that the additional controls are not reported for all producers. A small share of agricultural productive unites (UPA) had more than one head (leader). For these, age is the average age, while finished primary and access to private health, were coded as one if the individual variables for at least one of the heads took the value of one.

## 2.6.2 Municipality level analysis

Table 2.2 presents the results of the municipality level analysis. Columns 1 to 3 show the effect of collective action on the extensive margin of credit access (total number of credits), while Columns 4 to 6 show the effects on the intensive margin (total value of credits). The results evidence that collective action measured as the number of RPOs per capita, has a positive and statistically significant effect on both margins. The effects are robust to the inclusion of different sets of controls. In our preferred specification, which includes only exogenous controls (Columns 2 and 4), the coefficients are equivalent to 0.02 standard deviations for the total number of credits, and 0.06 for the value of credits. The greater increase in the value of credits granted, implies a positive effect of CA on the average size of credits allocated.

**Table 2.2 FE estimations – Total number and value of credits**

Dependent variable: VARIABLES	Number of credits (per capita)			Value of credits (per capita)		
	(1)	(2)	(3)	(4)	(5)	(6)
RPO (per thousand rural inhabitants)	1.204** [0.563]	1.146** [0.574]	1.679** [0.687]	0.600*** [0.189]	0.315** [0.123]	0.502*** [0.165]
Rain shock (cms)		0.002** [0.001]	0.001* [0.001]		0.000 [0.000]	0.000 [0.000]
Lag Local fiscal revenue (per capita)			-3.036*** [1.168]			0.921** [0.363]
Lag National transfers (per capita)			14.601*** [2.919]			-0.082 [0.491]
Lag Homicides (per capita)			-1.130*** [0.271]			-0.019 [0.028]
Constant	7.455*** [1.812]	3.760* [2.122]	-4.838* [2.768]	0.670*** [0.040]	0.243** [0.108]	0.013 [0.293]
Observations	15,615	14,373	11,980	15,615	14,373	11,980
R-squared	0.421	0.436	0.443	0.284	0.217	0.220
Number of Municipalities	1,117	1,115	1,077	1,117	1,115	1,077
Municipality FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Department-year FE	YES	YES	YES	YES	YES	YES

Robust standard errors in brackets, clustered at the municipality level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All monetary variables in real terms. Homicides per capita in logs. Estimations exclude the five principal cities in the country. Specifications with only municipality fixed effects, with municipality and year fixed effects, and with region-year fixed effects generate consistent results.

The former results evidence the existence of positive general equilibrium effects. This implies that rather than just a re-composition of credit provision between RPO members and non-members, collective action generates aggregate increases in credit, being an instrument for local financial development. The existence of positive general equilibrium effects implies that the supply of credit is flexible, and as such, an increase in access to credit of members does not crowd-out resources available for non-members<sup>92</sup>. General equilibrium results also suggest that collective action in the form of RPOs generates spillover effects, that is, these organizations also generate benefits to non-members and the community in general. Our fieldwork results evidence, for instance, that some RPOs allow non-members to commercialize their products through them. We also find that there is informal sharing of information between members and non-members, and that RPOs generate jobs, increasing the dynamism of the local economy. Furthermore, we find that RPOs are engaged in social activities such as fixing roads, which can open market opportunities increasing the demand for credit, as well as the willingness of banks to supply credit. Finally, we find that RPOs empower communities to raise their voices for political demands, bringing resources and new projects to the municipality, what can also increase the aggregate demand for credit.

### **2.6.3 Heterogeneous effects by type of producer and credit source**

We now present the results differentiating credit granted to small, medium and big farmers, and by the public or private banks. The results in Table 2.3 show that CA has a positive aggregate effect on credit granted to small farmers (both on the number and value of credits), but solely via increases in public credit. For big producers, the effect is also significant at both margins, but only through increases in private credit. In the case of medium-scale producers, neither the extensive or intensive margin effects are statistically significant.

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<sup>92</sup> Our fieldwork results corroborate this: all bank directors and analysts interviewed agreed that banks have surplus resources.

**Table 2.3 FE estimations – Number and value of credits by type of producer and source**

Number of credits (per capita)							Value of credits (per capita)					
Public credit			Private credit				Public credit			Private credit		
VARIABLES	Big (1)	Medium (2)	Small (3)	Big (4)	Medium (5)	Small (6)	Big (7)	Medium (8)	Small (9)	Big (10)	Medium (11)	Small (12)
RPO (pc)	0.007 [0.013]	0.005 [0.039]	1.094** [0.527]	0.064* [0.036]	0.015 [0.041]	0.053 [0.047]	-0.003 [0.002]	0.003 [0.006]	0.017* [0.009]	0.366** [0.153]	-0.018 [0.011]	-0.002 [0.002]
Rain shock (cms)	-0.000 [0.000]	0.000 [0.000]	0.001* [0.001]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]
Constant	1.094*** [0.182]	1.178*** [0.097]	3.686* [1.893]	0.238* [0.133]	0.363*** [0.129]	0.211** [0.106]	0.029*** [0.007]	0.036*** [0.009]	0.061*** [0.014]	-0.045 [0.095]	0.002 [0.023]	0.007* [0.004]
Observations	15,455	15,455	15,455	15,455	15,455	15,455	15,455	15,455	15,455	15,455	15,455	15,455
R-squared	0.481	0.360	0.400	0.125	0.196	0.272	0.036	0.398	0.590	0.096	0.252	0.228
No. Municipalities	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115
Municipality FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Department-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in brackets, clustered at the municipality level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All monetary variables in real terms. Estimations exclude the five principal cities in the country. Specifications with only municipality fixed effects, with municipality and year fixed effects, and with region-year fixed effects generate very similar results.



The results showing that the general equilibrium effect of CA is positive for small and big farmers but not for medium ones are non-trivial. One could expect the effect of collective action to be insignificant for big farmers, as these already face loose credit constraints. For instances, big producers can easily proof their creditworthiness (as they have high levels of income and assets) and have the human and financial capital required to cover the transaction costs of credit (e.g. obtaining financial certificates, land rights certificates). Under such conditions, the effect of collective action could be irrelevant for further reducing credit constraints. For small farmers, one could also expect the effect of collective action to be non-significant, if the credit constraints that these farmers face are too stringent (e.g. lacking land or other assets required as collateral), in which case the effect of CA would not be enough to effectively increase access to credit. In contrast to these hypothesis, we show that CA has a positive effect on both types of farmers, while there is no effect for medium farmers.

A first explanation for the above could be heterogeneity in the type of farmer that participates in RPOs, and thus exploits its benefits. If his was the case, we should find RPO participation rates of small and big farmers to be significantly higher than those of medium-scale farmers. This is not what we find, as participation rates are similar across farmer types (10% for small, 11% for medium and 12% for large).

We rather argue that the heterogeneous results stem from contextual characteristics binding the effect of collective action. In this case, the binding contextual condition is the structural segmentation of the agricultural credit market across farmer type and credit sources. As was discussed in Section 2, private credit tends to be biased towards big producers, whereas public credit tends to be biased towards small ones, leaving medium farmers as “the missing middle” (United Nations, 2006). We now discuss this in more detail.

### *Small farmers*

To further analyse the heterogeneous effects, we estimate the individual level Logit models by size of farmer. Tables 2.A3 and 2.A4 in the Annex show that for small farmers, RPO membership increases the demand for all sources of credits (public, private and cooperative), but the effect is strongest for public credit. Census data further shows that among the small farmers that participate in RPOs, 20% have access to public credit, whereas only 5% access private credit and 4% cooperative credit (CNA, 2016). The above implies that while collective action increases the demand for credit, small farmers continue to meet this demand via public credit. This is likely the result of public credit being cheaper (i.e. offering lower interest rates

than commercial banks), and of it entailing lower transaction costs. Our fieldwork results evidenced that for accessing public credit, small farmers only have to certify access to land (ownership or tenancy) and comment on how they plan to use the credit resources. The public bank agent then fills out the request forms for them, what reduces transaction costs. In contrast, when a small farmer requests a private credit, he has to present a fully detailed productive project (structured by a certified agronomist), and a full financial report (certified by an accountant). He also has to pay for the agronomic revision of the productive project. Transport and opportunity costs are also higher for accessing private credit, as not all municipalities have private bank branches: in almost half of the Colombian municipalities, the public bank is the only present financial institution. RPO membership can do little to reduce these structural conditions. This evidences how contextual conditions bind the effect of collective action.

The results on Table 2.A3 and 2.A4 also show that collective action generates a supply-side effect, which is only significant for small farmers. We cannot test whether the supply effect acts only through public credit, as information on the conditional approval of credit is not disaggregated by source. However, this is likely the case, for reasons aforementioned (the incentive, risk and cost-related negative bias of banks against small credits). Again, this result suggests that collective action replicates rather than counteracts the segmentation of the credit market (i.e. the effect of collective action is not sufficient to counteract the structural supply-side credit constraints that small farmers face for accessing private credit).

Why should we worry about small farmers continuing to be constrained from accessing private credit? Fieldwork evidences that this type of farmer does have a demand for private credit, and that this demand is not being met. One reason why small farmers prefer private credit, is that it offers benefits in terms of the timing of approval. While private banks approve credits in less than two weeks, the public banks usually takes more than a month. Farmers report the timing of credit to be a determinant issue for their credit decisions, as investments in agricultural activity have set times based on production and weather cycles. Indeed, farmers reported being willing to request informal loans (microfinance or money lenders) because of the quick approval, even if interest rates can be 10 times higher than those of formal sources.

### *Big farmers*

The results in Table 2.A3 and 2.A4 indicate that for big farmers, the effect of collective action acts only via increases in the demand (the effect of RPO membership does not increase the likelihood of credit approval, but does increase the likelihood of credit request). The null

supply-side effect is likely due to big farmers *de facto* experiencing loose credit constraints, so that the potential of collective action in farther loosening these is not relevant. This contrasts with the existence of a demand-side effect. We find that a big farmer who is part of an RPO, is 8 times more likely to access credit than a big farmer who is not. Our fieldwork results suggest that the increase in the demand for credit stems from collective action enabling big farmers to engage in considerably large collective projects (for example a joint fruit processing unit), which require large investments they cannot self-finance. For regular-sized investments, big farmers do opt for self-finance: census data shows that their rate of access to credit is actually lower than that of small or medium farmers. Once big farmers organise and engage in large-scale collective projects they demand credit. And due to the large size of investments, this demand is only met by private banks (the public bank has a cap on the size of farmers to which it can provide credit). Indeed, for big farmers, the average size of a private credit is 6,4 times larger than that of public credit. The above results imply that CA replicates the structural segmentation of private credit in favour of large operations, what further raises the levels of inequality in the rural financial market (in which big farmers constitute 1,2% of all farmers, but receive 43% of total credit resources and 67% of total private credit resources).

### *Medium farmers*

The municipality level estimations show that for medium farmers, there are no general equilibrium effects. The analysis at the individual level (Tables 2.A3 and 2.A4) does evidence a positive demand-side effect. This effect is strongest for cooperative credit (i.e. granted by financial/credit cooperatives). However, we are not able to test whether there is a general equilibrium effect on cooperative credit, as this information is not reported at the municipality level.

That medium farmers prefer to demand cooperative credit is likely the result of transaction costs. While the public bank has loose requirements for small farmers, it has stringent requirements for medium ones, who need to present certified productive projects, financial states and have to pay for the cost of issuing a mortgage. Private banks also request the above. Our fieldwork results evidence that these costs can add up to US 200. Financial cooperatives do not require any of the above.

Supply-side effects also sort medium farmers away from public and private credit. As mentioned previously, the public bank favours credit for small farmers due to normative reasons, while private banks favour large credits due to incentive, cost and risk considerations.

Under these conditions, medium-scale farmers are left financially underserved by both sources. Indeed, Figure 2.1 in Section 3 evidenced that contrary to credit for small and big farmers, credit for medium farmers did not increase significantly between 2002 and 2015.

Under a developmental perspective, the sorting of medium farmers away from private and public credit has negative consequences. First, there is a limited supply of cooperative credit: in Colombia it only represents 10% of all credits (CNA, 2016) and only 13% of municipality have financial cooperatives (Misión Rural, 2014). Second, cooperative credit is generally not granted under regulated preferential (Finagro) conditions, so interest rates are higher and it does not offer additional incentives (like the Rural Capitalization Incentive - ICR), or guarantee schemes (FAG). The results imply that the effect of CA is not sufficient to counteract this structural sorting of farmers across sources of credit.

## **2.7 Robustness Checks**

We now test the robustness of the results to different specifications and estimation strategies. First, we test for robustness to omitted variables bias. To this end, we estimate a cross section in which we include 23 different control variables reported in the agrarian census for the year 2013. Table 2.A5 in the Annex present the results, evidencing their robustness to the inclusion of different sets of controls, both for the number of credits allocated and for the value of credits allocated.

We also check for the robustness of the results to alternative measures of collective action. We estimate the results employing a measure of associational density (number of RPO members over rural population)<sup>93</sup>, rather than total number of RPOs. The results are robust to this measure<sup>94</sup>.

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<sup>93</sup> Note that census data corresponds to self-reported participation in RPOs, not necessarily in formal ones, what can generate differences with our RPO data, which corresponds solely to formal RPOs.

<sup>94</sup> Available upon request

To address for further endogeneity concerns not accounted for in the Fixed Effects model<sup>95</sup>, we estimate a differences-in-differences model with multiple treatment groups and periods<sup>96</sup>. We analyse increases in collective action (an increase in the number of RPOs in a municipality) as the treatment indicator (which switches on at different times for different municipalities). We focus on a subsample of 532 municipalities (48% of all municipalities) which start with no treatment (i.e. no increase in the number of RPOs)<sup>97</sup>. This strategy compares municipalities in which the level of collective action increased, with similar municipalities where it could have increased, but it did not<sup>98</sup>. We show that by 2015 basically all municipalities have switched on the treatment (Figure 2.A1), that the municipalities in this subsample are scattered throughout the country (Map 2.A5) and that these municipalities are in general similar to the average Colombian municipality (Table 2.A6).

The reduced form equation of this model is:

$$Y_{i,t} = \beta_0 + \beta_1 X_{i,t-1} + \beta_2 T_{i,t} + \mu_i + \delta_t + \varphi_{r,t} + \epsilon_{it} \quad (2.2)$$

Where  $\beta_2$  is the coefficient of interest and  $T_{i,t}$  is the treatment indicator (which varies across municipality and year). As in the fixed effect model, we include observable controls, as well as municipality, time and department-year fixed effects. The municipality fixed effect captures the ex-ante differences in collective action levels. In a model with multiple treatment groups and multiple periods, the underlying assumption for identification is that counterfactual outcomes in the absence of the treatment are independent of treatment. For DD with multiple treatment and control groups, this is tested running regressions of leads and lags of treatment take on (Angrist and Pischke, 2008). These are formalized as:

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<sup>95</sup> Controlling for time varying observables and including municipality, year and department-year fixed effects contributes to solving for endogeneity related to omitted variable bias; however, these controls do not account for endogeneity caused by municipality and time-varying unobserved variables that can affect access to credit. There could also be endogeneity due to reverse causality: For example, Fischer and Qaim (2012) find that access to credit has a positive effect on participation in farmer organizations, and Shoji et al. (2012) show that households who face credit constraints reduce their investment in social capital. However, our fieldwork revealed that credit dynamics do not explain the decision to constitute or join RPOs.

<sup>96</sup> We tried to estimate a regular DD employing as treatment a legal shock that affected RPO dynamics. However, this national level legal change affected all municipalities, and thus we cannot define a sole treatment and control group.

<sup>97</sup> Ideally we would define the subsample as those municipalities with zero RPOs. However, these (123) municipalities are statistically different to the rest of the municipalities in the country in several socioeconomic dimensions, making them a non-representative subsample. Furthermore, the sample size would reduce the power of the estimations.

<sup>98</sup> Note that although possible contagion effects from treatment to control municipalities cannot be ruled out, Benson (2019) documents how the majority of RPOs operate solely at the municipality level, suggesting that contagion effects should not be a major threat.

$$Y_{i,t} = \beta_0 + \beta_1 X_{i,t-1} + \sum_{j=-m}^q \beta_j T_{i,t}(t = k + j) + \mu_i + \delta_t + \epsilon_{it} \quad (2.3)$$

Where  $k$  is the time at which the treatment is switched on in municipality  $i$ . The test for the DD assumption is that  $\beta_j = 0$  for all  $j < 0$ .

The Differences in Differences (DD) estimations yield consistent results to the FE model. Table 2.4, shows that increases in the number of RPOs generate increases in access to credit. Although the coefficients at both margins are positive, the effect at the intensive margin is not significant at conventional levels. Figure 2.A2 in the Annex plots the coefficients and confidence intervals of the test of leads and lags of treatment adoption on both outcome variables. They show that the indicator variables for periods prior to the adoption of treatment are not significant, providing evidence of the adequacy of the DD estimations.

**Table 2.4 Differences in Differences – Total number and value of credits**

Dependent variable:	Number of Credits (per capita)				Value of Credits (per capita)			
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Increase in RPOs $_{i,t}$	3.100*** [1.113]	2.994*** [1.071]	2.384** [1.084]	1.697* [1.018]	0.192 [0.199]	0.215 [0.223]	0.207 [0.201]	0.117 [0.187]
Rain shock (cms)		0.004*** [0.001]	0.004*** [0.001]	0.005*** [0.001]		0.000* [0.000]	0.000** [0.000]	0.000*** [0.000]
Lag Local fiscal revenue (per capita)			-3.797*** [1.032]				1.850* [0.987]	
Lag National transfers (per capita)			7.098*** [2.501]				-0.042 [0.185]	
Constant	5.486*** [0.693]	3.054*** [1.059]	2.786*** [1.068]	-2.838** [1.281]	0.068 [0.043]	0.012 [0.067]	-0.045 [0.089]	0.035 [0.067]
Observations	7,416	6,783	6,739	6,763	7,416	6,783	6,739	6,763
R-squared	0.302	0.329	0.339	0.376	0.095	0.098	0.146	0.178
Number of municipalities	532	528	526	526	532	528	526	526
Municipality FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Region-year FE				YES				YES

Robust standard errors in brackets, clustered at the municipality level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All monetary variables in real terms. Estimations exclude the five principal cities in the country. We include Region-year fixed effects instead of Department-year FE as the sample is smaller and in around a third of departments it includes less than 5 municipalities. We do not include homicides in the set of socioeconomic controls due to missing values which reduce the number of observations by more than half.

The Differences in Differences results for the heterogeneous effects (Table 2.5) are also largely consistent with the FE model. The increase on access to credit for small farmers is explained

by increases in access to public credit, and that there are no significant effects on either source for medium farmers. The results for big farmers are positive, but lose statistical significance. Figures 2.A3 and 2.A4 in the Annex present the results for the lead and lags test, and evidence the adequacy of the estimation, as the lags of the treatment are not statistically significant.

**Table 2.5 Differences in Differences – Number and value of credits by producer type and source**

Number of credits (per capita)							Value of credits (per capita)					
Public credit			Private credit			VARIABLES	Public credit			Private credit		
Big	Medium	Small	Big	Medium	Small		Big	Medium	Small	Big	Medium	Small
(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Increase in RPOs <sub><i>i,t</i></sub>	-0.015 [0.041]	0.012 [0.174]	3.054*** [1.020]	0.039 [0.041]	-0.077 [0.049]	0.014 [0.081]	-0.007 [0.005]	0.009 [0.014]	0.064*** [0.019]	0.177 [0.221]	-0.025* [0.014]	-0.002 [0.001]
Rain shock (cms)	-0.000 [0.000]	0.000 [0.000]	0.004*** [0.001]	-0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000*** [0.000]	0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]
Constant	1.400*** [0.093]	-0.011 [0.148]	1.082 [0.999]	0.345*** [0.041]	0.160*** [0.053]	0.082 [0.110]	0.017** [0.007]	0.002 [0.010]	-0.012 [0.013]	-0.004 [0.057]	0.007 [0.013]	0.002 [0.001]
Observations	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783
R-squared	0.258	0.184	0.303	0.028	0.072	0.155	0.006	0.232	0.489	0.010	0.107	0.076
No. Municipalities	528	528	528	528	528	528	528	528	528	528	528	528
Municipality FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in brackets, clustered at the municipality level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All monetary variables in real terms. Estimations exclude the five principal cities in the country. Results are robust to the inclusion of controls. In this table we present our preferred specification, just including the rain shock.



## **2.8 The mechanisms**

In this section we briefly discuss the demand and supply side mechanisms through which collective action increases access to credit. Benson (2020) offers a detailed discussion of these mechanisms, as well as a description of the mixed methods methodology through which they were identified.

Our quantitative results showing that banks are 1,2 times more likely to approve individual credit to RPO members, relative to non-members, evidence a supply-side effect. On this regard, Benson (2020) finds that the supply of credit increases through several mechanisms. Banks perceive RPO members to be more creditworthy and thus are more likely to approve a credit request. The author discusses how RPO membership provides signals of farmer quality (through financial and commercial references provided by the organization) and project quality. For instance, banks are aware that through these organizations, farmers access inputs at lower prices (as they buy inputs without intermediaries and at scale quantities), access technology and technical assistance (mainly through public programs targeted at the organizations), access markets more easily (through joint direct commercialization) and have projects with lower risks (among others, as there is monitoring and a lower price volatility via output contracts). The preference for organized farmers holds at the aggregate level. For example, one of the bank directors interviewed mentioned that banks are more likely to offer credit in areas that are more organized, as this lowers the overall risk of granting credit. Overall, RPO membership reduces problems of imperfect and asymmetric information, increasing the likelihood of credit supply. The supply of credit increases not only through this mechanism, but more generally, as RPOs grant in-house credit to their members, and as banks grant associative credits directed solely towards RPOs.

With respect to the demand-side effect, our quantitative results show that RPO members are 2,5 times more likely to request agricultural credit than non-members. Benson (2020) finds that increases in the demand stem from RPO members engaging in new, larger and more profitable productive projects, which require investment. New projects emerge through access to public programs (granting resources for new projects), through social imitation effects and through peer leadership. Projects become larger and more profitable as a result of the previously discussed improved access to inputs, technology and output markets stemming from horizontal and vertical integration of farmers.

Another demand-side mechanism identified in Benson (2020) is collective action lowering transaction costs. This occurs as RPOs constitute a social network through which information flows, lowering the cost of accessing information about credit opportunities and about the credit application process. Finally, RPOs reduce risk credit constraints, as they constitute a safety net, among others, granting informal credit for emergencies, such as liquidity problems for meeting formal credit obligations.

## **2.9 Conclusion**

This paper analyses the relation between collective action in the form of Rural Producer Organizations (RPOs) and access to agricultural credit. We find evidence of a positive effect at both the individual and local level. Our results show that RPOs not only ease access to input and output markets, as previous studies have found (Desai and Joshi, 2014; Verhofstadt and Maertens, 2014; Vandeplas et al. 2013), but they also increase access to the credit market. We find evidence of positive general equilibrium effects. This implies that rather than collective action increasing access to credit for some (RPO members) while crowding-out credit available for others (non-members), it generates aggregate increases in access to credit, being a novel instrument to promote rural financial development.

Our results also show that the effect of collective action on access to credit is heterogeneous according to farmer type and credit source. It is positive for small and big farmers, but null for medium ones. Our analysis points towards these differential effects being the result of binding contextual conditions, in particular, the existing segmentation of the market across credit sources and farmer types.

On a policy perspective, the effect of CA on access to credit could be enhanced by institutionalizing the inputs that CA organizations such as RPOs can provide to the financial sector. First, as a source of information. Through these organizations, banks could formally and periodically gather information on local conditions (production conditions, commercialization opportunities, prevalent risks) and potential clients (RPO members, reference letters). Second, RPOs could be used as a mechanism to reduce search and allocation costs, by offering information and credit in a block to several farmers (i.e. RPO members) at a time. For instance, banks could target RPOs to provide individual credit in a block to several of its members. This is particularly relevant as a mechanism enabling banks to allocate small credits, which are too costly to allocate one by one. Third, RPOs could be used as diffusers of information. Banks could share information on credit opportunities and processes, as well as

provide financial education courses through RPOs, profiting from their established networks, visibility, leadership and past experience with credits (our analysis shows that RPO members are three times more likely to have access to credit than non-members). These networks reach not only RPO members, but more broadly, the local community. These mechanisms would be especially useful in disperse areas where they have no bank branches and thus credit transaction costs are too costly. In general, RPOs should be encouraged to provide in-house credits to their members, not only as a way of building credit history among farmers (i.e. financial inclusion) but also as these credits are used as a complement for formal credit, specially for providing liquidity in emergencies.

Policy interventions could also rely on CA organizations in order to counteract the existing segmentation of the credit market. For instance, private banks could be incentivized to reach organized small farmers in a block, offering credit to all RPO members at once, rather than going home by home offering credit to individuals (i.e. reducing search costs). These small credits could be offered and approved at the same time (in a block), reducing approval costs (for instance, by carrying out a joint productive project assessment, as well as joint project monitoring). In this sense, RPOs would serve as financial intermediaries, helping to crowd-in credit resources that would not be granted through separate small loans. The same approach could be used for increasing the supply of credit for medium-scale farmers.

In all of these cases, RPOs are used as intermediaries that can crowd-in credit resources and which reduce problems of imperfect and incomplete information in the credit market. These findings and policy recommendations are relevant for any context in which the agricultural credit market is imperfect and in which communities have the need and the capacity to act collectively.

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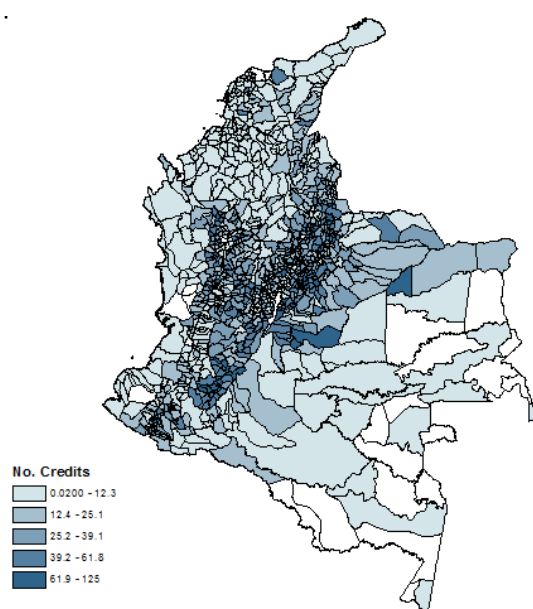
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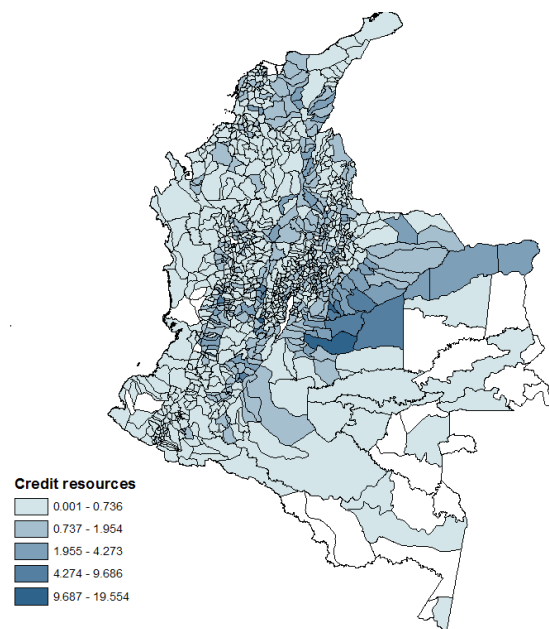


## Annex 2

**Map 2.A1. Number of credits per capita  
(2002-2015)**



**Map 2.A2. Value of credits per capita  
(2002-2015)**

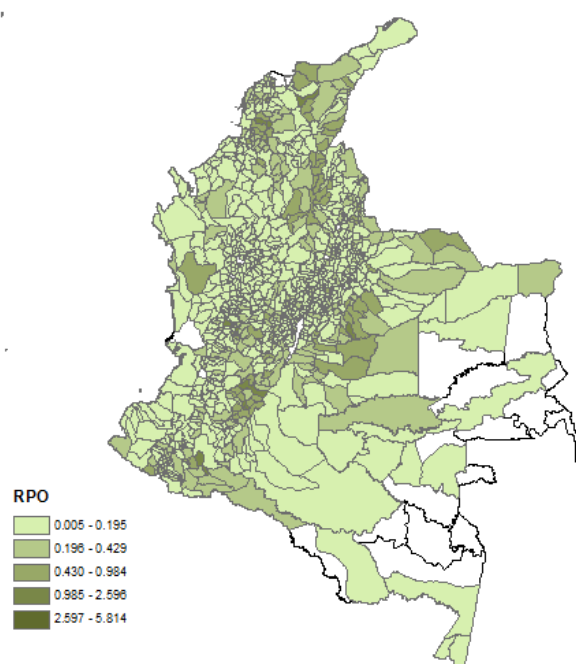


**Table 2.A1. Characteristics of each credit source**

Category	Public credit	Private credit	Cooperative credit
<b>Approval time</b>	Weeks	Days	Days
<b>Interest rate</b>	Low interest rate (around 1,2%)	Low interest rate (for big farmers)	Higher interest rates (3%), as these are not regulated.
<b>Credit length</b>	Long term credits (up to 10 years)	Long term credits (up to 10 years)	Short and medium terms
<b>Requirements</b>	Easy request process for small farmers  Subsidized project plan (50.000 vs. 300.000 private banks)	Less stringent mortgage requirements for big and medium farmers. Some allow co-signer to be wife	Few requirements.  Lends small amounts without co-signer.
<b>Type of clients</b>	Small farmers	Small to big farmers	Small and medium farmers
<b>Geographic coverage</b>	Large territorial presence	Some territorial presence	Scarce territorial presence
<b>Cultural aspects</b>	Tradition of being the agricultural bank (some farmers think it is the only one that lends for agricultural projects or the only one that grants incentives)		Solidaristic principles, community based
<b>Additional benefits</b>	Incentives (ICR, LEC) and restructuring alternatives  Can offer complementary public guarantee schemes	Incentives (ICR, LEC) and restructuring alternatives	Offers (short) training programs, awards  Lends small amounts even if the person is reported in credit history database  Do not carry out ex post investment control (flexibility in using the money)

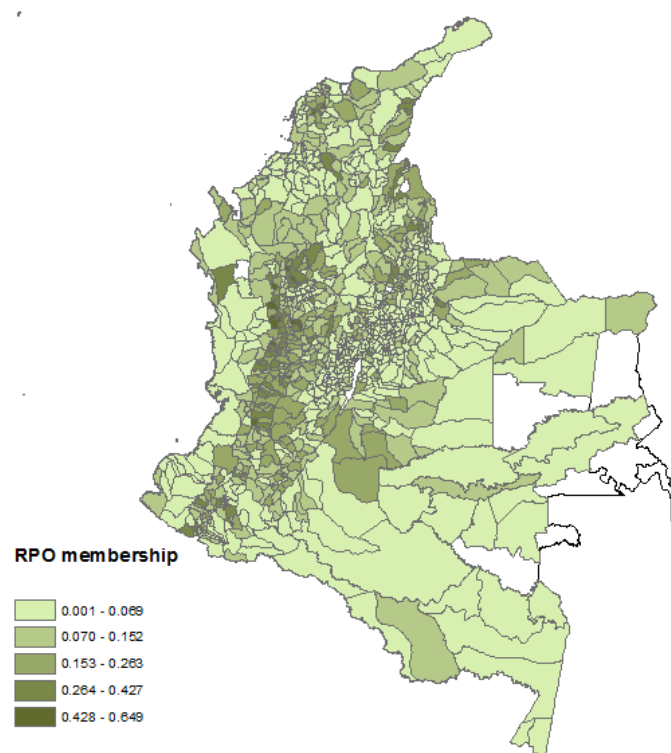
Source: Interviews carried out during research and guidelines of credit processes available online

**Map 2.A3. Spatial distribution of RPOs (per thousand rural inhabitants)  
(2002- 2015)**



Source: Author's estimations, based on RUES

**Map 2.A4 - Spatial distribution of RPO membership  
(Share of producers who are members of RPOs)**



Data source: CAN, 2016

**Table 2.A2. Descriptive Statistics – Municipality Panel Data**

Variable	Obs.	Mean	Std. Dev.	Min	Max
<b>A. Independent variables</b>					
RPO (per thousand rural inhabitants)	15,615	0.206	0.475	0.000	27.972
<b>B. Dependent variables</b>					
<i>Main</i>					
Value of credits (per capita rural) - COP	15,726	0.789	2.326	0.000	132.845
Number of credits per thousand rural inhabitants	15,726	22.644	25.235	0.000	221.805
<i>Farmer type</i>					
Value of Credit (per capita rural) - Big farmers	15,726	0.244	2.023	0.000	130.248
Value of Credit (per capita rural) - Medium farmers	15,726	0.303	0.633	0.000	11.396
Value of Credit (per capita rural) - Small farmers	15,726	0.243	0.406	0.000	13.500
Number of credits - Big farmers	15,615	0.325	1.154	0.000	24.886
Number of credits - Medium farmers	15,615	3.253	4.599	0.000	51.442
Number of credits - Small farmers	15,615	19.227	23.483	0.000	206.076
<i>Credit source</i>					
Value of Credit (per capita rural) - Public	15,726	0.392	0.629	0.000	17.295
Value of Credit (per capita rural) - Private	15,726	0.394	2.142	0.000	132.490
Number of credits - Public	15,615	20.928	24.209	0.000	217.419
Number of credits - Private	15,615	1.818	3.529	0.000	73.070
Average credit size - Public	14,113	39.117	103.225	0.700	8053.590
Average credit size - Private	11,811	251.451	772.070	0.570	38821.860
<b>C. Control variables</b>					
Rain shock (cms)	14,450	637.615	337.045	0.000	4368.792
Local fiscal revenue (per capita) -COP	13,114	0.180	0.373	0.000	14.198
National transfers (per capita) - COP	13,112	0.151	0.296	0.000	13.331
Homicides (per capita) (log)	10,238	-8.070	0.914	-11.998	-4.405

Note: Data on monetary resources is expressed in Million COP and real terms, using 2002 as base year.

**Table 2.A3. Logit model – Individual access to credit by producer type**

VARIABLES	Probability of credit demand			Probability of credit supply conditional on demand		
	Big	Medium	Small	Big	Medium	Small
RPO member	0.559*** [0.091]	0.590*** [0.036]	0.803*** [0.030]	0.041 [0.092]	0.022 [0.042]	0.089*** [0.032]
Received Technical Assistance	0.069 [0.108]	0.092** [0.044]	0.838*** [0.029]	-0.422*** [0.114]	-0.470*** [0.047]	0.444*** [0.036]
Commercial activity	2.060*** [0.284]	1.727*** [0.079]	0.939*** [0.033]	1.562*** [0.384]	0.914*** [0.091]	0.015 [0.046]
Owns agricultural machinery	1.656*** [0.083]	1.122*** [0.042]	0.275*** [0.030]	1.313*** [0.091]	0.851*** [0.048]	-0.472*** [0.041]
Community organization member	0.370*** [0.114]	0.375*** [0.075]	0.029 [0.059]	0.13 [0.120]	0.281*** [0.085]	-0.253*** [0.065]
Male	0.694*** [0.085]	0.535*** [0.033]	0.234*** [0.019]	0.497*** [0.094]	0.346*** [0.030]	-0.149*** [0.023]
Above average age	-0.313*** [0.060]	-0.114*** [0.024]	-0.076*** [0.013]	-0.366*** [0.063]	-0.121*** [0.025]	-0.037* [0.020]
Finished primary	0.336*** [0.060]	0.080*** [0.026]	-0.017 [0.016]	0.331*** [0.063]	0.039 [0.027]	-0.176*** [0.021]
Private health	0.930*** [0.087]	0.022 [0.043]	-0.328*** [0.025]	1.300*** [0.092]	0.350*** [0.043]	-0.314*** [0.032]
Ethnic background	-0.836*** [0.173]	-0.795*** [0.130]	-0.358*** [0.122]	-0.559*** [0.170]	-0.465*** [0.152]	0.239* [0.127]
Constant	-10.110*** [0.296]	-6.613*** [0.096]	-3.345*** [0.046]	-7.501*** [0.398]	-3.580*** [0.107]	1.438*** [0.053]
Observations	1,068,983	1,068,983	1,068,983	155,910	155,910	155,910

Robust standard errors in brackets, clustered at the municipality level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Results are based on self-report of credit request and access during 2013. A small share of agricultural productive unites (UPA) had more than one head (leader), for these, age is the average age, while finished primary and access to private health, were coded as one if the individual variables for at least one of the heads took the value of one. We do not report results for the specification including the partial set of controls, but the results are very similar.

**Table 2.A4. Logit model – Individual access to credit by producer type and source**

Dependent variable: Probability of accessing credit by source and type of producer

VARIABLES	Public bank			Private banks			Cooperatives		
	Big	Medium	Small	Big	Medium	Small	Big	Medium	Small
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
RPO member	0.332** [0.136]	0.535*** [0.041]	0.719*** [0.031]	0.984*** [0.101]	0.655*** [0.058]	0.603*** [0.057]	0.882*** [0.300]	1.421*** [0.114]	1.178*** [0.080]
Received Technical Assistance	-0.018 [0.160]	0.104** [0.050]	0.854*** [0.032]	0.432*** [0.130]	0.305*** [0.062]	0.560*** [0.042]	0.647** [0.323]	0.356*** [0.115]	0.889*** [0.062]
Commercial activity	2.199*** [0.419]	1.852*** [0.114]	0.975*** [0.037]	2.580*** [0.708]	1.704*** [0.164]	0.975*** [0.051]	2.345*** [0.219]	1.199*** [0.249]	0.934*** [0.072]
Owns agricultural machinery	1.666*** [0.104]	1.156*** [0.048]	0.316*** [0.030]	1.705*** [0.142]	1.142*** [0.055]	0.110** [0.052]	1.470*** [0.300]	1.095*** [0.093]	0.343*** [0.050]
Community organization member	0.431*** [0.133]	0.433*** [0.088]	0.066 [0.059]	0.005 [0.180]	-0.058 [0.111]	-0.266** [0.113]	-0.149 [0.569]	0.426*** [0.143]	0.115 [0.102]
Male	0.542*** [0.113]	0.537*** [0.035]	0.248*** [0.020]	0.792*** [0.153]	0.483*** [0.060]	0.194*** [0.030]	0.223 [0.401]	0.454*** [0.107]	0.135*** [0.035]
Above average age	-0.070 [0.073]	-0.060** [0.026]	-0.052*** [0.014]	-0.849*** [0.101]	-0.370*** [0.043]	-0.209*** [0.019]	-0.464* [0.255]	-0.262*** [0.067]	-0.092*** [0.032]
Finished primary	0.371*** [0.079]	0.001 [0.030]	-0.088*** [0.017]	0.290*** [0.087]	0.260*** [0.042]	0.121*** [0.029]	0.580* [0.308]	-0.100 [0.076]	-0.105*** [0.035]
Private health	0.475*** [0.101]	-0.188*** [0.048]	-0.486*** [0.029]	1.938*** [0.117]	0.636*** [0.059]	0.095** [0.038]	1.236*** [0.280]	0.439*** [0.108]	-0.239*** [0.051]
Ethnic background	-0.953*** [0.187]	-0.863*** [0.163]	-0.467*** [0.129]	-0.921*** [0.228]	-0.774*** [0.149]	0.009 [0.200]	-1.055* [0.606]	-1.234*** [0.201]	-0.551*** [0.176]
Constant	-10.662*** [0.425]	-7.223*** [0.126]	-3.905*** [0.052]	-12.543*** [0.735]	-8.445*** [0.185]	-4.995*** [0.079]	-11.406*** [0.456]	-9.196*** [0.269]	-5.967*** [0.091]
Observations	1,068,983	1,068,983	1,068,983	1,068,983	1,068,983	1,068,983	959,107	1,068,983	1,068,983

Robust standard errors in brackets, clustered at the municipality level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Results are based on self-report of credit request and access during 2013, for all the rural producers in Colombia. We do not present results for the specification including the partial set of controls, but the results are very similar

**Table 2.A5. Cross section results – Total number and value of credits granted per capita**

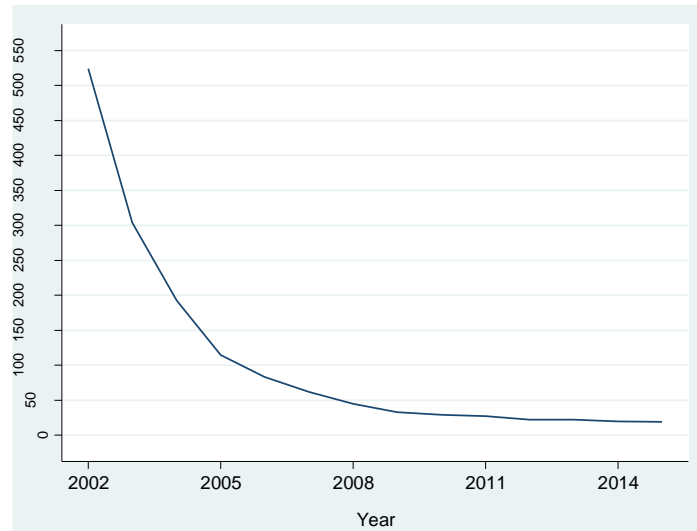
VARIABLES	Total number of credits					Total value of credits		
	(1)	(2)	(3)	(4)	(5)	(5)	(7)	(8)
RPO (per thousand rural inhabitants)	7.625*** [2.663]	6.898*** [2.621]	7.462*** [2.878]	8.396*** [2.893]	3.570** [1.763]	3.676** [1.820]	6.350** [2.698]	6.218** [2.678]
Rain shock (cms)		-0.001 [0.003]	0.002 [0.003]	0.000 [0.002]		0.001 [0.001]	0.002 [0.001]	0.001 [0.001]
Local fiscal revenue (per capita)			-3.229** [1.291]	5.343*** [1.752]			3.206** [1.268]	2.562* [1.374]
National transfers (per capita)			36.892*** [8.515]	21.320*** [7.176]			0.523 [1.883]	0.982 [2.205]
Homicides (per capita)			-0.121 [0.951]	-1.404 [0.872]			0.554** [0.241]	0.198 [0.236]
Land quality index				-0.419 [0.679]				0.048 [0.137]
Height				0.001 [0.001]				-0.000 [0.000]
Distance to capital city				-0.023* [0.013]				-0.004 [0.003]
Distance to market				-0.029** [0.012]				-0.003 [0.002]
Gini Index				-10.676 [8.903]				0.917 [2.287]
Poverty (UBN)				-0.234*** [0.053]				0.003 [0.014]
Fiscal performance index				-0.162 [0.170]				0.025 [0.036]
Public Investment/ expenditure				0.135 [0.174]				-0.111* [0.061]
Received Technical Assistance				20.372*** [6.719]				4.574** [2.129]
Commercial activity				5.428 [6.869]				1.977 [2.370]

Owns agricultural machinery				11.923				0.254
				[7.485]				[1.988]
Community organization member				-3.405				-4.243
				[7.993]				[2.823]
Medium farmers share				-22.967***				1.477
				[7.347]				[1.845]
Big farmers share				-3.460				10.534**
				[16.215]				[5.051]
Male				-5.513				-3.512
				[11.518]				[2.594]
Above average age				7.463				-0.717
				[11.969]				[4.862]
Finished primary				-69.993***				-3.062
				[10.364]				[2.827]
Private health				-41.386***				1.494
				[7.689]				[2.530]
Ethnic background				-18.193***				1.116
				[3.699]				[1.843]
Constant	32.062***	33.254***	21.849**	55.971***	1.563***	0.878	3.386	9.611
	[0.999]	[1.915]	[8.797]	[20.933]	[0.334]	[0.671]	[2.098]	[6.029]
Observations	1,117	1,082	820	795	1,117	1,082	820	795
R-squared	0.014	0.012	0.099	0.407	0.064	0.068	0.194	0.229

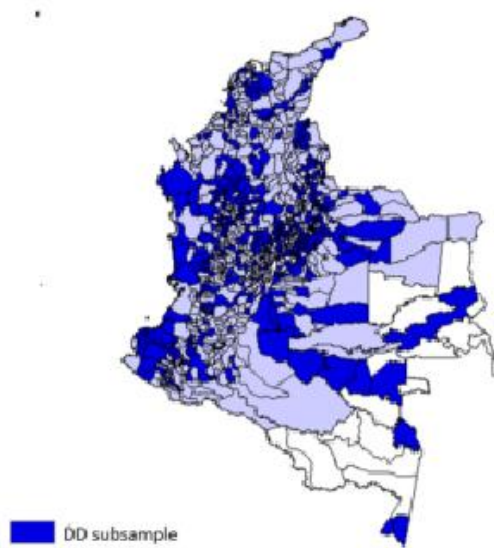
Robust standard errors in brackets, clustered at the municipality level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All monetary variables in real terms. Homicides per capita in logs. Gini and poverty values correspond to 2005. Estimations exclude the five principal cities in the country



**Figure 2.A1 Number of municipalities without treatment (2002-2015)**

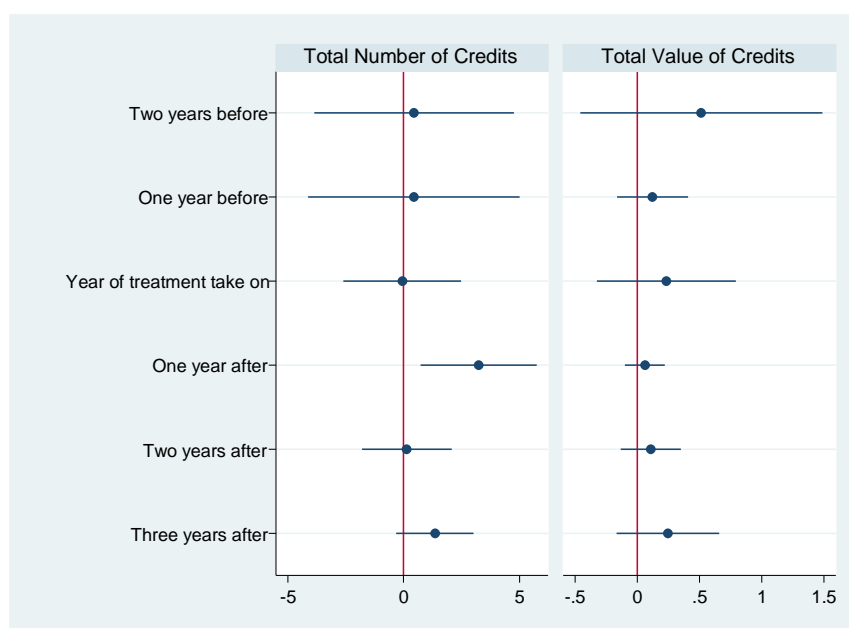


**Map 2.A5. DD subsample municipalities**



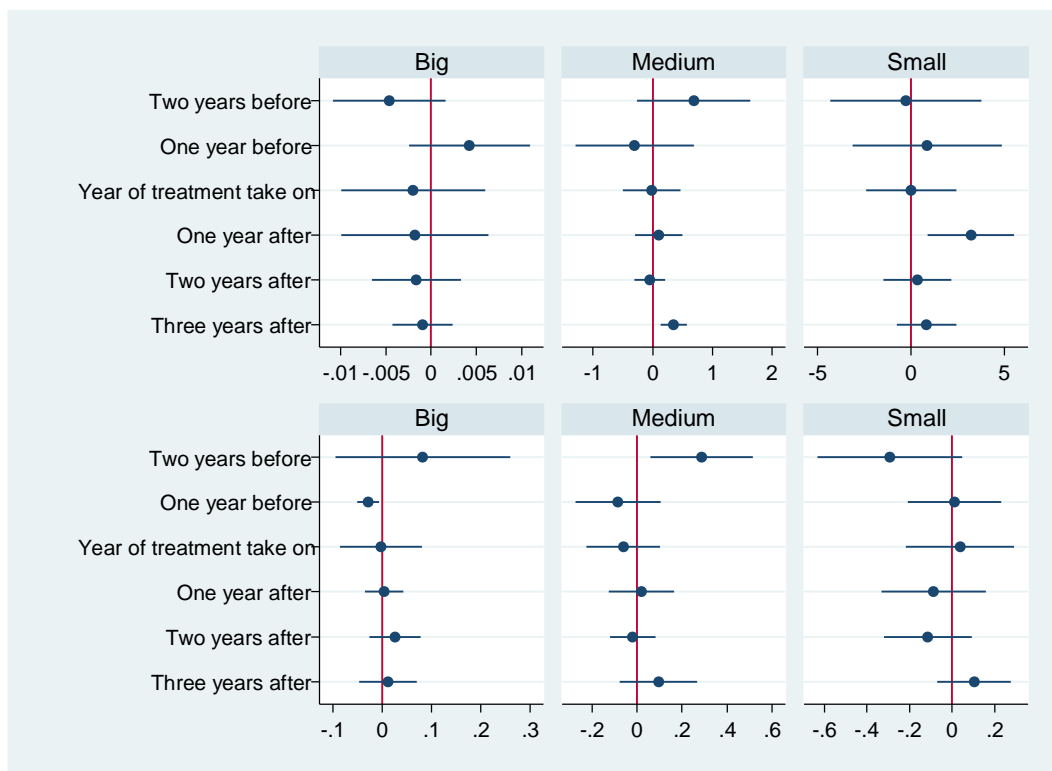
**Table 2.A6. Differences in means test – Municipalities in DD sample**

	Mean		Difference
	Not in sample	In sample	
Local fiscal revenue (per capita) -COP	0.205	0.185	
National transfers (per capita) - COP	0.108	0.199	***
Homicides (per capita) (log)	-8.133	-8.053	
GDP per capita (COP)	11.614	10.897	
Rural Poverty (UBN Index)	50.230	53.661	***
Distance to Department capital	79.293	79.600	
Total resources of credit pc	0.947	0.641	***
Number of credit pc	22.82	23.15	
Municipalities	569	532	

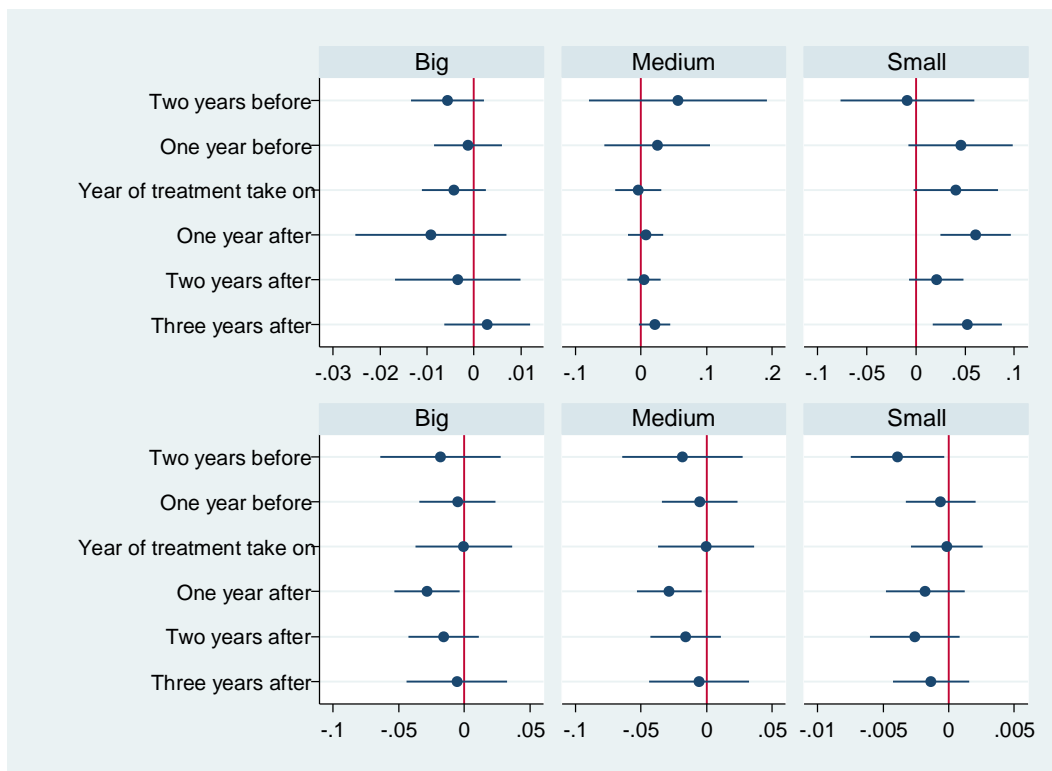
**Figure 2.A2. Leads and lags of treatment adoption – total number and value of credits**

The lead and lags regressions plotted in this figure work as placebo tests, analysing whether there are significant differences in credit outcomes between treated and controls prior to treatment adoption (i.e. whether there are pre-existing parallel trends). They also provide information on the ex post dynamics of the effects, showing that in general, the effect treatment effect takes a period to act and then dissipates.

**Figure 2.A3. Leads and lags of treatment adoption – total number of credits by producer type and source (Panel A, public credit - Panel B, private credit)**



**Figure 2.A4. Leads and lags of treatment adoption – total value of credits by producer type and source (Panel A, public credit - Panel B, private credit)**



## Chapter 3

### More Profitable Projects, Access to Information or a Safety Net? How Collective Action reduces credit constraints

#### Abstract

*Agricultural credit is a key source of investment and thus of productivity growth and poverty reduction in the rural world. Despite this, most farmers in developing countries remain credit constrained. This evidences the relevance of exploring alternative ways to increase access to agricultural credit. This paper analyses how collective action in the form of Rural Producer Organizations (RPOs) loosens credit constraints. The demand and supply-side mechanisms are identified through the analysis of over 60 semi-structured interviews and four municipality case studies in Colombia. The case selection was based on a novel combination of nested analysis and stratified random sampling. The results evidence that collective action reduces quantity constraints as it increases the supply of credit (through credit granted from RPOs to members, and from banks to RPOs). Furthermore, banks are more likely to supply individual credit to RPO members, as membership signals farmer quality and project quality, screening applicants and reducing problems of imperfect and asymmetric information. Collective action also increases the demand for credit, as organized farmers engage in new, larger and more profitable projects, by accessing quality inputs, technology, markets and government support. Lastly, CA reduces transaction cost constraints, through the sharing of information about credit opportunities, and reduces risk constraints, as RPOs constitute a safety net.*

**Key words:** Credit constraints, agricultural credit, collective action, rural producer organizations, Colombia, nested analysis, mixed methods

#### 3.1 Introduction

Increasing access to agricultural credit is crucial for rural development as credit constitutes a main source of investment, growth and poverty reduction (Deininger and Duponchel 2014; Conning and Udry, 2007; Burgess and Pande, 2005; Carter and Olinto, 2003). Despite the above, most farmers in developing countries continue to face stringent credit constraints which reduce their ability to carry out profit-maximizing investments (Guirkingner and Boucher, 2008). There is evidence, for instance, that credit constrained farmers in Rwanda have significantly lower yields than unconstrained farmers, and that their use of good fertilizers and improved seeds is lower (Ayalew, Deininger and Duponchel, 2014) These authors estimate that

removing credit constraints would increase the value of agricultural output by 17%. Similar evidence for the case of Colombia shows that access to credit doubles agricultural income (Leibovich et al., 2013) and increases land productivity (Gáfaró, Ibáñez, and Zarruk, 2012).

Diverse policy interventions have been designed to reduce credit constraints. These include titling property rights so that land can be used as collateral, granting direct public credit, regulating and subsidizing interest rates, promoting bank branch expansion and offering public loan guarantees (de Soto, 1989; Giné, 2011; Burgess and Pande, 2005; Besley, Burchardi and Ghatak, 2012; Conning and Udry, 2005). These alternatives have proven insufficient. In the case of Colombia, for instance, only 11% of farmers report accessing credit in a given year (CNA, 2016).

New alternatives for reducing credit constraints are to be identified. The study by Benson et al. (2019) identifies one of these alternatives: collective action<sup>99</sup> in the form of Rural Producer Organizations (RPOs). RPOs include agricultural cooperatives, associations and similar organization through which farmers integrate horizontally and vertically, to gain easier access to input, technology and output markets (Valentinov, 2007; Verhofstadt and Maertens, 2014; Bebbington, 1997; Narrod et al. 2009). Relying on data on access to credit for 2,3 million agricultural producers, and on credit allocations and RPOs for 1.100 municipalities in Colombia during a 15-year period, the authors find that CA increases access to credit not only at the individual level, but also at the local level, generating positive general equilibrium effects and thus constituting an instrument for rural financial development.

This paper builds on the quantitative results of Benson et al. (2019) and carries out a Small-N qualitative analysis to provide a more comprehensive picture of the relation between collective action and access to credit. It identifies the demand and supply side mechanisms through which collective action reduces credit constraints. The analysis is based on four case studies (four municipalities in Colombia) in which a total of 60 semi-structured interviews were carried out to organized and unorganized farmers, local banks and policy actors. I propose a novel methodology for case selection, which combines Lieberman's (2005) approach for nested analysis with Fearon and Laitin's (2008) stratified random case selection. The procedure relies

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<sup>99</sup> There are various definitions of collective action, all of which refer to the involvement of a group of people with shared interests, and voluntary action to pursue those shared interests (Meinzen-Dick et al. 2004).

on the econometric results of Benson et al. (2019). I estimate the residuals of the main model<sup>100</sup>, and divide the units of analysis (municipalities) according to deciles of residuals. I then semi-randomly<sup>101</sup> select two cases from the decile of lowest residuals (or the on-the-regression-line cases); and two from the decile of highest residuals (or the off-the-regression-line cases). Profiting from the availability of quantitative subnational data for a large set of socioeconomic characteristics, I carry out differences-in-means tests in order to discard the existence of systematic or extreme differences between the selected cases and the average municipality.

This step-to-step case selection strategy constitutes a first contribution of the paper, in particular, to the methodological literature on case selection (Gerring, 2005; Fearon and Laitin, 2008) and on mixed methods research design (Lieberman, 2005; Brady and Collier, 2004). The proposed structured case selection methodology relying on quantitative data reduces concerns of selection bias and is particularly relevant for studies in which there is a large number of potential cases (e.g. subnational analyses). In addition to this, the synergistic integration of Large-N Analysis (LNA) and Small-N Analysis allows to obtain analytical leverage and stronger causal inference from general causal relations, as well as from in-depth and contextually-based inferences. Through the proposed nested analysis approach, I evidence that Small-N Analyses profit from relying on both on-the-line cases (to carry out further analysis, in particular, to identify underlying mechanisms) and on off-the-line cases (to structurally search for heterogeneity which can explain the low fit of the LNA).

Through the qualitative analysis I identify the demand and supply-side mechanism through which collective action in the form of RPOs reduces credit constraints. I classify the mechanisms according to whether they loosen price, quantity, transaction cost or risk credit constraints, following the categorization of constraints proposed in the literature (Guiringer and Boucher, 2008). The results show that collective action reduces quantity credit constraints<sup>102</sup> through increases in the supply of credit. This occurs, first, as RPOs grant credit to their members; second, as farmers are able to access associative credit lines offered by banks specifically to organizations; and third, as collective action increases the likelihood of banks supplying individual credit. The latter stems from RPOs increasing the creditworthiness of farmers through the screening of applicants, as RPO membership provides signals of project

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<sup>100</sup> The Fixed Effects model estimating the relation between RPOs in a municipality and the total number of credits allocated.

<sup>101</sup> Combining random and purposing sampling, as detailed in the methodology section.

<sup>102</sup> Constraints that make the supply of credit lower than the effective demand for credit

and farmer quality. In this way, RPO membership lessens problems of imperfect and asymmetric information.

I also find that CA increases the demand for credit as through RPOs farmers engage in new, larger and more profitable projects which require investment. The profitability of productive projects increases as RPOs enable farmers to access inputs at lower prices through economies of scale and the skipping of intermediaries. They also ease access to technology, technical assistance and government support. Furthermore, RPOs enable farmers to access markets under better conditions, through joint direct commercialization and contracts.

There are additional mechanisms through which this form of collective action increases the demand for credit. One is the reduction of self-rationing from transaction costs. This occurs as RPOs constitute information hubs through which information on credit opportunities and on the application process flows. Finally, RPOs reduce self-rationing from risk credit constraints, as they constitute a safety net and provide emergency informal loans which can be used to meet formal credit obligations in cases of low liquidity.

The qualitative analysis provided in depth evidence of how different types of credit constraints operate, and on the mechanisms through which each is loosened through collective action organizations. I also provide evidence on the heterogeneity of credit constraints within formal credit sources (public vs. private credit). The above constitute contributions to the literature on rural financial development (Ali, Deininger and Duponchel, 2014; Guirking and Boucher, 2008; Ayalew, Deininger and Duponchel, 2014; Boucher and Guirking, 2007; Carter and Olinto, 2003; Conning and Udry, 2005).

The demand and supply-side mechanisms were identified mainly from the on-the-regression-line case studies. In the off-the-line cases, the mechanisms were found to be weaker. The evidence points towards this being the result of the structural weakness of RPOs in the off-the-line municipalities. In turn, I find that the weakness stems from the way in which the organizations emerge. I find that while in the on-the-line municipalities RPOs tend to emerge organically, as a bottom-up initiatives seeking collective, productive and long-term benefits, in the off-the-line municipalities, RPOs tend to be created non-organically, as a result of top down external stimulus offering short term benefits to organized farmers (e.g. receiving resources

from a targeted public program)<sup>103</sup>. These non-organic RPOs are constituted lacking common objectives and collective action rules. The above makes the organizations weak, limiting the potential benefits they can offer, including the potential benefits for reducing credit constraints. As such, these weak RPOs are not able to increase the quality of productive projects or the demand for credit, they do not lower transaction cost constraints through the effective sharing of information, and they do not constitute a safety net that can reduce risk constraints.

The findings highlighting the heterogeneity in the nature and potential impact of RPOs constitute a contribution to the literature on collective action (Ostrom, 1990; Uphoff, N. and Wijayarathna, 2000) and on rural collective action organizations (Desai and Joshi, 2014; Vandeplas et al. 2013; Abebaw and Hail, 2013; Markussen and Tarp, 2014; Bebbington, 1997). These findings also contribute to the literature on sociological organizational theory (Andrews, et al. 2010; McPherson and Rotolo, 1996; Hannan and Freeman; 1977; Scott and Meyer; 1991), by providing micro level evidence on how environments and internal organizational features (e.g. incentives and rules) condition the structure and functioning of organizations, shaping organizational types and organizational success.

The remainder of this article is structured as follows. The next section discusses the literature on credit constraints and on collective action organizations. Section three describes the context; in particular, the way in which the credit market and RPOs operate in Colombia. The fourth section discusses the methodological approach, detailing the case selection strategy and the structuring of the interviews. In section five I present the results of the case studies, and in section six, I discuss the results building an analytical framework explaining the demand and supply side mechanisms through which collective action reduces credit constraints. The last section concludes.

### **3.2 Credit constraints and collective action**

Credit constraints take different forms, categorized as price, quantity, transaction cost and risk constraints (Guiringer and Boucher, 2008). Price constraints refer to the price of credit (i.e. the interest rate) being too high, making potential investments through credit unattractive. Quantity constraints refer to those that make the supply of credit lower than its effective

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<sup>103</sup> Note that I do not argue that it is a fixed underlying municipality characteristic what determines the strength of collective action in the municipality, but rather that the type of RPO relates to the way in which they emerge. In the off-the-line cases, one type of emergence (externally induced) was more common than the other.



demand<sup>104</sup>. The supply of agricultural credit tends to be low as banks consider agricultural activity to be too risky, and because approval costs are too high. This is especially so in developing countries in which the agricultural insurance market is weak or non-existent, connectivity is limited and in which most farmers are small and have low access to technology and commercialization opportunities.

Transaction cost constraints refer to non-interest monetary and time costs that reduce the effective demand for credit: they lead to self-rationing. These refer to demand side costs<sup>105</sup> such as the cost of traveling to a bank branch, preparing the application, obtaining the required documentation, and waiting for the credit to be approved. The work of Ayalew, Deininger and Duponchel (2014) evidences how prevalent transaction cost constraints are: while 69% of farmers in Rwanda report being transaction cost constrained, only 6% report constraints due to lack of collateral. Transaction cost constraints are particularly salient in developing countries where levels of human capital are low. Limited literacy and financial literacy are often cited as a significant constraint on credit demand (United Nations, 2006). In contexts such as a Colombia, in which 17% of farmers are illiterate and 57% have only primary education, farmers often have to resort to hiring someone to carry out the credit application (e.g. *tramitadores de crédito*), which further increases transaction costs. Another factor that increases transaction costs in developing countries is low connectivity (transport and ICTs), which increases the cost of accessing information and of traveling to a bank branch. For instance, in the department of Tolima in Colombia, over 70% of farmers report taking more than an hour to travel to the bank. These costs are estimated to represent 20 additional points of interest rate (Dube et al., 2006).

Analogous to transaction cost constraints, risk constraints reduce the effective demand for credit. In this case, farmers refrain from accessing credit not because of costs, but because of the risk of not being able to repay the debt, potentially losing the asset employed as collateral. Risk constraints are a major obstacle for financial access. For instance, Guirkinger and Boucher (2008) find that 50% of credit constrained households in Perú are risk constrained. This type of constraint is aggravated by the inherent risk of agricultural activity, which is highly vulnerable to weather shocks, pests, fluctuations in commodity prices and exchange rates. In

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<sup>104</sup> The demand after considering transaction costs and risk

<sup>105</sup> Note that supply side transaction costs (i.e. approval costs for the bank) are rather understood as quantity constraints, as they reduce the supply of credit. These generate unmet credit demands, as individuals are involuntarily rationed from credit (Guirkinger and Boucher, 2008). In contrast, demand-side transaction costs reduce the effective demand for credit (i.e. the individual refrains himself from borrowing).

the case of Colombia for example, 72% of farmers' report having experienced an adverse shock, while almost none reports access to agricultural insurance (CNA, 2016).

Loosening credit constraints requires increasing the willingness of banks to approve credit requests, as well as increasing the willingness of farmers to demand credit. In the next sections I describe how collective action does such. CA refers to joint action taken by individuals pursuing a common objective. In rural areas, a key and common materialization of collective action are Rural Producer Organizations. These include agricultural cooperatives and associations which farmers create and join, among others, because through them they can increase their scale of production (Desai and Joshi, 2014; Valentinov, 2007) adopt new technologies and the use improved inputs (Verhofstadt and Maertens, 2014; Conley and Udry, 2010). RPOs also ease access to information and good agricultural practices (Abebaw & Hail, 2013), and offer benefits in terms of commercialization, easing access to output markets at better prices and through products with added value (Bebbington, 1997; Narrod et al., 2009).

The potential impact of collective action is however, heterogeneous. Its success depends on the rules established among members, on their incentives and their capacity to cooperate rather than free ride (Ostrom, 1990). This relates to the broader discussion in literature on organizational theory regarding how the success of organizations in general, depends on their relation with the environment (Hannan and Freeman, 1977; Scott and Meyer, 1991), as well as on internal organizational factors like leadership (Andrews et al. 2010) and technology (Perrow, 1967). The contextual and organizational conditions affecting organization type and performance will be further discussed in section six.

### **3.3 The Context: Agricultural credit and Rural Producer Organizations in Colombia**

Agricultural credit refers to credit employed for productive purposes. In Colombia, agricultural credit is granted principally by the public bank and is allocated mainly to small farmers (the majority of farmers are small). Some private banks also supply agricultural credit, but in smaller numbers and larger values, targeting large-scale producers. Credit conditions including interest rates and payment structures are similar across both sources, partly as these are regulated by the Government. Financial and credit cooperatives also grant agricultural credit, but at a lower scale (around 10% of all credits). More recently, rural microcredit has become a relevant source, as despite being significantly more expensive, it is easy to access.

The number of credits allocated in Colombia significantly increased during the last decade (a 6-fold increase between 2002 and 2015). Despite this, the access rate remains low: according to the Agrarian Census of 2013, only 11% of farmers access credit in a given year. Credit constraints include risk self-rationing and high transaction costs (DNP, 2014).

In order to request a credit, a farmer has to file a credit request in a bank, specifying the productive project on which he will use the resources. The farmer must also certify a good credit history and a strong paying capacity (having sufficient income and assets). Additional requirements are certifying access to land and, in some cases, having a co-signer. The request and approval process can take between a week and several months (being longer in the public bank)<sup>106</sup>.

In Colombia, there is more information on the dynamics of agricultural credit than on those of collective action organizations. In fact, Benson et al. (2019) are the first to estimate the number of RPOs across municipalities. These authors find that between 2002 and 2015, over 27.000 organizations were created throughout the country. RPOs are the most common form of collective action in the rural sector, although CA also materializes in other forms, including women's unions or social organizations (CNA, 2016). The census data also reports that despite the large number of RPOs, less than 10,5% of farmers participate in these.

The interviews carried out for this paper reveal that in general, farmers acknowledge the benefits that RPOs can generate. However, some choose not to participate because they consider participation costs to be too high. Some of these costs are monetary (e.g. paying a membership fee) while others are non-monetary (e.g. establishing rules, monitoring compliance, making collective decisions). There are additional non-monetary costs, including the cost of investing time and effort, as well as investing in production practices and quality inputs in order to meet standards established by RPOs. Among the reasons reported for RPO participation, I found increasing production scale and commercialization opportunities, as well as gaining access to government support (as many programs require beneficiaries to be organized).

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<sup>106</sup> Among the farmers interviewed for this paper, most had requested credit more than once, usually to the public bank. Credit sizes ranged from \$2 million COP (USD 700) and \$30 million COP (USD 10.400). Those who had accessed credit considered the request process to be relatively simple, but considered troublesome to pay the quotas, especially due to variability in weather and market conditions.

Among the ten RPOs interviewed, there was a high heterogeneity in terms of size, age and nature of activity. For instance, one of the RPOs had over 100 members, a couple had under 20, and the rest around 30. The age of RPOs ranged from 26 to two. Three of the RPOs interviewed were women's organizations, while the rest had both male and female members. Another relevant finding is that RPO members tend to be similar: they live nearby, most are small farmers producing for commercial purposes rather than for subsistence, and they produce the same products.

The interviews also revealed some of the main problems that RPO face. Some have to do with the weakness of collective action. For instance, in several organizations there was a lack of clarity in the long term and collective purpose of the RPO, as well as on the rules needed to ensure compromise and joint collaboration. Another common problem was scarce commercialization opportunities: even when commercializing jointly, finding commercialization agreements or stable buyers was reported to be difficult. I also found some RPOs are dependent on the support of the Government (receiving resources from specific programs). In periods of low public support, the organizations become passive actors.

### **3.4 Methodology**

The Small-N Analysis is based on four case studies (four municipalities in rural Colombia), in which a total of 60 semi-structured interviews were conducted to RPO members, non-organized farmers, credit analysts and local policy actors. The data was gathered during a six-week period of fieldwork between September and October of 2017. The SNA is aimed at identifying the mechanisms that explain the relation between CA and access to credit estimated through the Large-N Analysis in Benson et al. (2019).

#### *Municipality selection*

The case selection is based on a novel methodology which exploits the availability of quantitative data and the existence of a large number of potential cases. The methodology builds on the econometric model of Benson et al. (2019), specifically on the fixed effect model estimating the relation between collective action (measured as the number of Rural Producer Organizations per capita in a municipality) and access to credit (measured as the number of credits granted in a municipality). I estimate the residuals  $(\hat{y}_i - y_i)^{107}$  of this model, and then

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<sup>107</sup> The differences between the estimated value of the outcome variable and its observed value.

stratify the units of observation (1.100 municipalities) in deciles of residuals<sup>108</sup>. I focus on two decile groups: the decile of lowest residuals (i.e. on-the-regression-line municipalities), and the decile of highest residuals (i.e. off-the-regression-line municipalities)<sup>109</sup>.

I select two cases from each of the decile groups. The cases were selected using a combination of random and purposive sampling, reducing the concerns of investigator bias<sup>110</sup>. More specifically, I randomly ordered the municipalities in each decile, and selected the first two to comply with the following criteria:

- i) The security conditions would not represent a risk during fieldwork. These were identified as municipalities with a homicide rate lower than the national mean.
- ii) The municipality was not a department capital, and was located at least an hour away from one. This, so that urban dynamics would not interfere with the rural-based analysis.
- iii) Agricultural credit was granted throughout the study period by both public and private banks, including credits to small, medium and big farmers. The objective of this criteria was to allow for variation in the analysis.
- iv) There were sufficient RPOs to contact for the interviews (at least 12)
- v) The second municipality was from a different region of the country<sup>111</sup> relative to the first one. This aimed for a larger generalizability of results.

The on-the-line cases selected were Sapuyes in the department of Nariño, and Betulia in the department of Santander. I then selected the two off-the-line municipalities, following the same criteria plus an additional one: being located in the same departments as the two on-the-line municipalities. The above, with the objective of reducing potential differences (observed and unobserved) between the on and off-the-line cases. The two selected off-the-line cases were Guaitarilla in Nariño and Guadalupe in Santander. Figure 3.1 illustrates the geographic location of the four cases:

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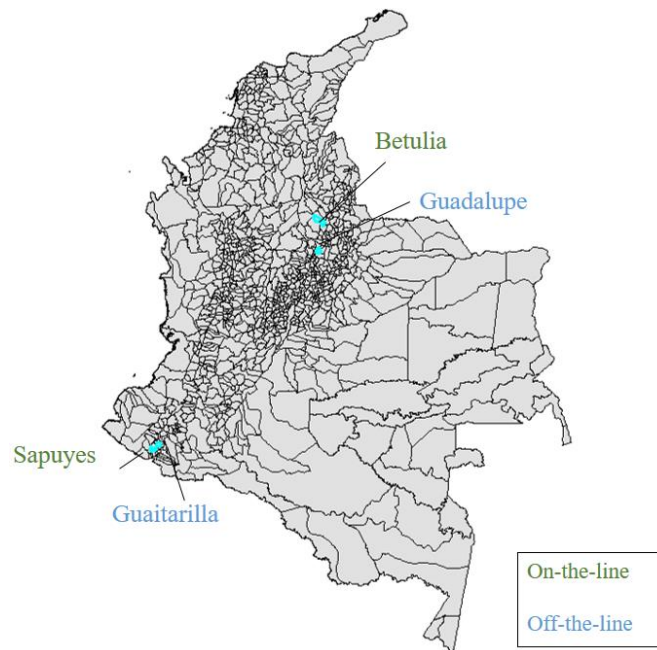
<sup>108</sup> By relying on residuals of an econometric model, the selection procedure is dependent on the adequacy of the specification of the model. Benson et al. (2019) carry out several robustness tests to prove that the model specification is adequate.

<sup>109</sup> For a graphic explanation of on and off-the-regression line observations, see Figure 3.A1 in the Annex.

<sup>110</sup> The relevance of meeting this set of criteria was considered more important than the benefits of carrying out a pure random selection. Purposive sampling is necessary to overcome practical investigator limitations.

<sup>111</sup> The five regions are: Atlantic, Pacific, Orinoquia, Amazonia, Andina. I do not stratify by region, I just rely on information on the region to validate whether the second municipality complies with criteria V, in the same manner as I validate compliance with the previous criteria.

**Figure 3.1 Geographic location of the case studies**



This case selection methodology is a combination of the nested analysis approach proposed by Lieberman (2005), in which on-the-line cases are selected for model testing Small-N Analysis<sup>112</sup>, and the approach proposed by Fearon and Laitin (2008) on stratified random case selection not restricted to well predicted cases. The proposed approach can also be understood as a mixture of typical and deviant cases (Gerring, 2005), in which the on-the-line municipalities are typical cases of the causal relation, while the off-the-line cases are deviant ones (i.e. the relation between the independent and dependent variables is not well predicted by the econometric model).

Qualitative data is analysed both within and across cases, as described in Table 3.1.

**Table 3.1 Cross case analysis**

Municipality type		Analysis type
On-the -line	On-the line	Identify common mechanisms, processes, contextual characteristics that explain <b>how X leads to Y</b> .
		The existence of common factors would allow for some generalizability among on-the-line municipalities, as they are found in municipalities from different regions of the country.

<sup>112</sup> Lieberman (2005) advises to select only on-the-line cases for “model testing SNA”. However, I also choose cases from the off-the-line subgroup, as the aim of the SNA is not only model testing (i.e. testing the strength of the LNA), but also building an analytical framework. Moreover, studying cases which are not well predicted by the model yields valuable information for understanding the nature of collective action and the nature of its relation with access to credit.

Off-the-line	Off-the-line	Identify common mechanisms, processes, contextual characteristics that explain <b>why X does not lead to Y</b> <sup>113</sup> .  Again, the existence of common factors would allow for some generalizability among off-the-line municipalities, as they are found in municipalities from different regions of the country.
On-the -line	Off-the-line	Comparing the on-the-line municipality with the off-the-line municipality within the same department allows to identify <b>why in relatively similar contexts, the relation between X and Y can be stronger or weaker</b> than predicted by the model.

### *Adequacy of the selected cases*

Because the cases were not selected based on a pure random manner, they could be systematically different from the average municipality, introducing potential biases to the analysis. In order to address this, I run differences-in-means tests on a large set of socioeconomic characteristics at the municipality level and assess whether each case has statistically significant differences with respect to: i) the average Colombian municipality; and ii) the average decile municipality (on or off-the-line groups).

The objective of this test is not to claim that the selected municipalities are fully representative of the whole country, nor of the subgroup, but to discard the existence of systematic or extreme differences between them which could complicate generalizations or could make them inappropriate for analysing the mechanisms, as systematic differences can increase the likelihood of identifying mechanisms that only operate in a particular setting. In addition to the above tests, I analyse whether there are systematic differences between the two municipalities selected within each department. Again, this is aimed at discarding potential systematic or extreme differences, not at claiming that the municipalities are directly comparable, as would be required in a “most similar” case selection approach in standard cross-case comparisons.

Table 3.2 presents the results of the differences-in-means tests. It indicates whether there is a statistically significant difference (positive + or negative -) between each municipality and each reference group<sup>114</sup>. Information is averaged between 2002 and 2015, and comes from various sources (Panel municipal CEDE, Finagro, RUES, DANE, IGAC, DNP, the Ministry of Defence and municipality reports).

<sup>113</sup> The reasons that make the municipality an outlier might be idiosyncratic or might be generalizable to other municipalities.

<sup>114</sup> For ease of understanding, I do not show means and p-values, but signs (+ and -) indicating statistical significance and the direction of the difference.

The results show that while some differences are statistically significant (for instance population and poverty levels), overall, the municipalities are statistically similar to both the average Colombian municipality, and the average subgroup municipality. This is reassuring, as despite the existence of some divergences, none of the cases (not even the off-the-line ones) are systematically more or less developed than average.



**Table 3.2 Differences-in-means test**

	On-the-line								Off-the-line					
	Sapuyes, Nariño				Betulia, Santander				Guaitarilla, Nariño			Guadalupe, Santander		
	Mean	Statistically significant difference			Mean	Statistically significant difference			Mean	Statistically significant difference		Mean	Statistically significant difference	
		Colombia	Decile subgroup	Off-the-line department municipality		Colombia	Decile subgroup	Off-the-line department municipality		Colombia	Decile subgroup		Colombia	Decile subgroup
Rural population	5505		-	-	4116	-	-	+	9228		+	3663	-	
Poverty (UBN Index)	36.2			-	43.1		+		54.2		+	32.08		
Gini Index	0.467				0.429				0.465			0.433		
GDP per capita (COP)	6.127				14.7				10.34			26.397	+	
Agricultural GDP per capital (million COP)	2.702				6.4	+			4.889			3.81		
Local fiscal revenue (per capita) -COP	0.074				0.537	+		+	0.064			0.208		
National transfers (per capita) - COP	0.164				0.238	+			0.136			0.197		
Homicides (per hundred thousand inhabitants)	4.7	-	-	-	25.2				20.89			12.639	-	
Share of population that finished primary school	15.20%				16.9%				6.30%			10%		
Share of ethnic population	9.00%				0				0.60%			0.4		

Share of small farmers	94.50%				49%				99%			94%		
RPOs per thousand rural inhabitants.	0.254				0.247				0.315			0.235		
Total resources of credit pc	0.519				0.526				0.819			0.820		
Number of credit pc	12.31		-	-	23.39			-	62.949	+		58.857	+	
Main agricultural products	Potatoes, carrots, wheat, maize, milk.				Livestock, plantains, maize, coffee, yuca, cocoa, fruits				Wheat, potatoes, maize, milk				Livestock, coffee, cocoa, guava, sugar cane, maize, yuca, plantain	
Travel time to department capital	2h				3h				1,5h				4,5h	
Comments	Located in the southern mountains of the country. 7km south from Tuquerres, where private banks and financial cooperatives are located.				Located in the northeast region of the country, nearest private bank located in Zapatoca, 24 kms away				Located in the southern mountains of the country, 16 kms north from Tuquerres, where private banks and financial cooperatives are located.				Located in the northeast region, nearest private bank located in Oiba, 23 km away	

### *Informant selection and interview content*

Over 60 semi-structured interviews were carried out, around 15 in each municipality. Key informants included:

- (6) RPO members, from two RPOs. In each organization, I interviewed three members: the RPO leader, one member who had accessed credit, and one member who had not accessed credit. The interviews were aimed at understanding the nature of RPOs and how they reduce credit constraints.
- (1) Farmer who has accessed credit but is not an RPO member. These interviews were aimed at gaining an outsider perspective on why farmers do not join collective action organizations, and how they are able to access credit without the advantages that CA offers.
- (1) Branch manager or credit analyst of the local public bank. These interviews were focused on identifying supply side mechanisms determining access to credit, and how this relates with collective action. They also aimed at identifying particularities of public credit provision.
- (1) Branch manager or credit analyst of the local private bank. These interviews were aimed at identifying supply side mechanisms and particular perspectives of private banks.
- (1) Branch manager or credit analyst of the local financial/credit cooperative. These interviews focused on identifying supply side mechanisms and particular perspectives of financial cooperatives.
- (1) Secretary of Agriculture of the municipal government. The objective of these interviews was understanding the perspectives of local policy makers and gaining insights on the local agricultural sector.
- (1) Mayor, with the objective of gathering information on the general context of the municipality and the particularities of the agricultural sector.
- (1) Priest, to gather an independent perspective on local conditions.
- In addition to these interviews, I carried out national level interviews to the associativity director of Finagro (Fund for Agricultural Finance), the president of Asomicrofinanzas (Association of Microfinances of Colombia) and the advisor of the director of the Agrarian Bank. These interviews focused on the macro level conditions of the agricultural credit market and on the potential of collective action for enhancing local financial development.

In order to select the RPOs to be interviewed, I relied on information from the unique registry of social organizations (RUES). Registered RPOs in each municipality were randomly ordered, and the first two to answer my call were selected<sup>115</sup>. Members of each RPO were also selected semi-randomly from the contacts provided by the leader<sup>116</sup>. This semi-random procedure aimed at reducing snowball sampling concerns.

To select the non RPO member interviewee, I relied on information provided by the agricultural input store or the farmer's market, directly requesting the contact details of farmers who were not part of an RPO, and interviewing the first person I could contact. Finally, I directly contacted the local banks and asked to speak with the branch manager or the credit analyst who managed the agricultural credit line.

Some general issues about the interviews are worth discussing. First, the wording and sequencing of the guiding questions evolved little throughout the research and did not vary significantly among interviewees (of the same type)<sup>117</sup>. Second, RPO members and bank staff interviewed included diverse profiles (e.g. men and women, young and senior), providing useful variation in the analysis. Third, all interviewees were informed about the nature of the research and of how the information gathered in the interviews would be employed. Each of them granted oral informed consent for participating in the research. Fourth, considering the nature of the questions, which are mainly descriptive and do not touch sensitive issues (e.g. power relations within RPOs, manipulation of credit allocation), I do not believe there were relevant issues of self-selection in who agreed to be interviewed (indeed, basically all of the people contacted agreed to be interviewed). The non-sensitive nature of the questions also reduces concerns of misreporting or particular biases in the responses. Additional methodological considerations are included in Annex A.

### **3.5 Case Study results**

This section presents the results of the case studies. It describes the dynamics of collective action and credit in each case studied. The findings are then systematized and discussed

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<sup>115</sup> I obtained the contact information (telephone number) of RPO leaders through the Secretary of Agriculture, and in a couple of cases, through local social leaders or NGOs.

<sup>116</sup> I intended to randomly select the members to be interviewed. In practice, random selection was difficult as some leaders did not have an electronic version of the list of members or their cell phone numbers to send me beforehand. Ultimately, the selection was quasi random as I often ended up speaking to a member who happened to be in the town centre that day (e.g. doing an errand).

<sup>117</sup> Interview guidelines available upon request

analytically in section six (the discussion section), organized around the demand and supply mechanisms through which collective action loosens credit constraints. For detailed municipality profiles, see Annex B.

### **3.5.1 Betulia, Santander (on-the-line)**

Betulia is a small municipality in the department of Santander. It has a population of 5.200, 50% of which are poor based on Unsatisfied Basic Needs. The municipality experienced violence due to the armed conflict, but the current security situation is stable. Agriculture is the main economic activity, around products such as coffee, tomatoes, fruits, maize and livestock. Despite being a predominantly agricultural municipality (its agricultural GDP per capita is significantly higher than the average Colombian municipality), local public investment in agriculture is low.

The number of per capita credits in Betulia is similar to the country average. Credit is mainly granted by the public bank, and more recently, by a financial cooperative (Coomultrasan). Although access to credit has increased during the last decade (partly due to improvements in the security conditions), credit constraints persist. One of the salient constraints is travel costs to the bank branch, as road conditions in the municipality are quite bad<sup>118</sup>.

The number of RPOs per capita in Betulia is also similar to the national average. Local RPOs were reported to emerge as bottom-up initiatives of the communities. Some of the organizations were created with the objective of producing and commercializing greenhouse tomatoes, a product that has become quite successful in the area. Some RPOs emerged as a mechanism to demand change, in particular, after the building of a hydroelectric plant that destabilized the environment, while offering scarce economic benefits to the population<sup>119</sup>. This generated a general sense of discontent which motivated the community to organize in order to have a stronger voice for making demands; and also, in order to collectively overcome local economic barriers. The interviews evidenced that social capital in Betulia is strong: there is a sense of community and cooperation. This can relate to the impact of the Peace and Development Projects

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<sup>118</sup> The municipality head is 90 km away from the department capital (Bucaramanga), but it takes more than three hours to travel them on an unpaved road.

<sup>119</sup> To build the ISAGEN hydroelectric plant part of the municipality had to be flooded; farmers lost productive land because of this. Farmers reported the plant increasing humidity levels, killing fish and causing the collapse of a newly built road due to topographic changes. All of this, without generating employment or growth.

(implemented by the EU during the first years of the 2000s), which invested considerable resources in developing productive projects and in the reconstruction of social cohesion.

I interviewed four RPOs in Betulia. All of them were created as bottom-up initiatives, mainly for productive purposes. The RPOs were quite successful despite differing in size, age, gender composition and location. One of the organizations was Aprob, created 26 years ago, with 100 active members, most producing tomatoes. Members mentioned they started cultivating tomatoes through the RPO, while before this, they produced less profitable products. In addition to starting to cultivate a new product, they also started to use a new technology: greenhouses. To build these greenhouses, members had to carry out an initial investment, for what several requested agricultural credit. That is, the demand for credit increased after joining the RPO and starting the new productive project. Peer support among members of Aprob was reported to be important for the process of starting the new crop, as well as for sustaining it efficiently. For instance, members regularly share information and advice on how to cope with pests. As one of interviewees mentioned: “let’s say that the crop of someone has a disease, then the others say, look, that is solved with this or that. In this sense there is collaboration”. The sharing of information in this RPO takes place both in person and through a Whatsapp group.

Aprob also offers its members technical assistance, and sells inputs in its own input store. The inputs are bought at scale and skipping intermediaries, so they are offered at a lower price and at credit. In addition to offering credit for inputs, the RPO offers credits for other productive purposes. These credits are small, as they depend on the contributions made by members (or external donors). The RPO leader highlighted that one of the advantages of accessing in-house credit is that this allows farmers to build their credit history, which they can then use as reference for accessing formal agricultural credit: “banks request a financial certificate, so if they [RPO members] have had credit here for microcredit or for inputs, we [the RPO] give them the certificate that serves as support for their credit application”.

Credit analysts interviewed corroborated the relevance of this screening mechanism. They also mentioned that in addition to requesting financial references, they request certificates of RPO membership, as these provide additional information on farmer’s experience and knowledge (i.e. a signal of farmer type). Membership also provides them with valuable information on commercialization opportunities and production techniques (i.e. a signal of project type). As mentioned by one of the analysts: “we request a certificate of RPO membership and annex it to the credit request to certify experience,

that he is with the organization, and that gives support to the application, it is very important (...) it shows that he is part of a group, that he has a defined market, that he has good cropping practices”. Another analyst similarly stated that “it is super good that he is an RPO member, because I already know he knows about the activity, and he has become a member so that his costs are lower, or so that he can sell. So it generates more trust relative to the one who is not associated. For the one who is not associated, one has to look into him a bit more”.

The director of the public bank branch highlighted another relevant aspect of the relation between banks and RPOs. He said that because inadequate road conditions increase travel costs for potential clients, he chooses to visit different areas of the municipality to directly search for clients. In these visits, he contacts RPOs, as it is easier to search for clients through the organizations, rather than contacting farmers one by one. The analyst of the private bank corroborated this. He reported contacting RPOs to offer them either associative credit (for the RPO), or individual credits in a block (i.e. several similar individual credits at once). He mentioned the example of a recent meeting with an RPO, during which he negotiated 25 individual credits at once (25 of the 45 members requested a credit that day). Because these credits were granted in a block, their approval costs were lower. For instance, the cost of revising the documentation (which has to be paid by the client) was offered at a discounted rate, given that the revision process was similar (and thus easier) for all of the credits. In an interview to another credit analyst he stressed that information flowing among peers can also increase credit demands and reduce the cost of accessing information on credit opportunities and on the application process, what she termed the “voice to voice mechanism”.

Another of the RPOs interviewed was Asocopa, created in 2005 with 40 members. This organization bought and rented land for cultivating fruits. As in the case of Aprob, members of Asocopa engaged in a new productive activity after joining the RPO. The organization sold the produce through commercial contracts negotiated with different markets in cities throughout the country. Again, as in Aprob, members reported information and knowledge flowing throughout the organization. The leader mentioned he constantly attends technical assistance workshops, after which he meets with the rest of the members to pass on what he learned. Part of the information that flows throughout this network has to do with credit opportunities. As the leader put it “I told them [the RPO members], look, what you need to do [to apply for credit], is this and this, go there [to the bank], and I can reference you”.

Some interviewees in this municipality referred to other forms of peer influence in relation to credit dynamics: a social imitation effect. An analyst from the local financial cooperative mentioned for instance, that credit demands multiply thanks to the influence of peers, especially among RPOs "you see yourself as a mirror of the other RPO members, if you see things are going well for one, you look for a way to be equally good, or better. And when looking for this, one seeks resources, and credit increases".

This credit analyst also mentioned that farmers who are members of RPOs might have a higher demand for credit due to a complementarity effect with resources received through public programs targeted towards RPOs. He specifically mentioned receiving several credit demands from organized farmers who had accessed resources from the Coffee Federation: "the Federation gives farmers \$5 million COP, but they have to find other \$10 million, so this is a benefit for us [the financial cooperative]".

The third RPO interviewed in Betulia was Asoperiso. It was created 8 years ago, and has 65 fishermen members. Some of the members have dropped out because the organization is not as successful as they expected. This is partly explained by the nature of the RPO, conceived more as a voice mechanism to demand jobs and specific benefits, than as a productive organization. Evidence of the above is that members of this RPO have not received any training through the organization, they have not commercialized fish jointly, or have demanded credit jointly.

The last RPO interviewed was Asovenplaya, created 8 years ago, with 29 female members. The RPO commercializes fish. Members used to commercialize this product standing near a highway, with no equipment but Styrofoam refrigerators. After joining the RPO, they began to collectively demand support from the hydroelectric plant and from the local government in order to build proper stands. They received resources for this. The RPO members also accessed technical assistance through the organization, in which they learned how to process and pack the fish, adding value to their product in order to perceive a higher price. Regarding credit dynamics, one of the members mentioned that although the public bank has repeatedly offered them credit, they have not yet accepted. However, they are now considering to do so, in order to finance part of the installation costs required for the new stands. This is another example of how through RPOs, farmers access new and more profitable projects which increase their demand for investment, and thus for credit.



The interviews evidence that RPOs in Betulia are in general strong, and tend to emerge as long-term production oriented organizations. These organizations offer advantages for accessing new and more rentable projects (e.g. greenhouse tomatoes, fish selling stands). They allow access to inputs at a lower cost and ease access to technical assistance programs through which they learn how to add value to their products (e.g. packaged fish), what not only increases their income, but also their demand for credit. RPOs also offer informal credit, building credit history which serves as a financial reference for accessing formal credit (serving as a screening mechanism for banks). Furthermore, banks report RPO membership to provide valuable information, not only as a signal of farmer type but also of project type. Banks also highlighted how they target RPO members to offer and approve credits in a block, lowering search and approval costs. This case study also illustrates how through RPOs, information and knowledge flows, reducing the cost of accessing information, included that related to credit opportunities.

### **3.5.2 Sapuyes, Nariño (on-the-line)**

Sapuyes is located in the south of Colombia in the department of Nariño, 3.000 meters above the sea level. It is 80 km south of the department capital (Pasto). The municipality is small, with a population of 7.300, mostly dedicated to agriculture<sup>120</sup>. Sapuyes has traditionally been a peaceful area, despite being in one of the departments most affected by the armed conflict. Poverty rates have decreased during the last decade as access to social services have improved.

The number of credits allocated per capita in Sapuyes is similar to the country average. Most of the credits (75% during the study period) are granted to small farmers, which constitute the majority of farmers in the area. There are no banks in Sapuyes, so farmers have to go to Túquerres, a nearby town where they find both public and private banks.

In general, the interviewees shared the view that the municipality is socially integrated and that solidarity networks are strong (i.e. social capital is strong). Collective action dynamics in Sapuyes are similar to those of the other on-the-line municipality (Betulia): the number of RPOs per capita is similar to the national average. Also as in Betulia, RPOs appear to emerge organically as bottom-up and production-oriented initiatives, or as a mechanism to demand social change. In this municipality, the number of RPOs increased in the midst of the national agrarian riot of 2013, during which local social leaders

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<sup>120</sup> As in Betulia, the support of the local government to RPOs and to the agricultural sector in general is weak, although it has increased with the new mayor.

emerged and encouraged the community to organize. The riot was particularly strong in Nariño, in part because of its indigenous and farmer mobilization tradition.

I interviewed two RPOs in Sapuyes, both of which were quite successful. Prolesa was created 8 years ago and has 40 members dedicated to producing and commercializing milk. The members of this organization contributed monetary resources and jointly bought a plot of land. They then received financial resources from the national government, and together with their own monetary contributions, they then bought a large milk tank. Thanks to this investment they were able to commercialize milk directly (they currently commercialize more than 2.600 litres of milk per week), skipping the commercial intermediary who had monopsony power and thus paid milk at a lower price. Another reason why members of Prolesa receive a higher price for their product, is that in order to sell through the RPO, members have to comply with quality standards, which are revised twice a day. Although members of Prolesa have very little education, the organization is conceived as a production oriented organization and is managed accordingly. An example of this is that members agreed to reinvest profits from the commercial activity in order to buy the plot of land.

While this collective asset (the land plot) could be used as collateral for accessing associative credit (the public bank offered credit several times to the RPO), the members decided not to request one, as they did not want to risk losing the collateral. Members of Prolesa do access credit individually. Furthermore, they access in-house credit through the RPO. One of the members highlighted that in-house RPO credits are used in emergencies to ease liquidity constraints “For example, if I need money urgently, I find money through the RPO (...) it is like an insurance (...) sometimes one asks for it to pay for another credit obligation in another place”. In this sense, the credit granted by the RPO works not only to increase access to (informal) credit, but also constitutes a safety net, mitigating some of the liquidity risks that self-ration farmers out of formal credit.

Having access to a safety net for informal loans (among peers or through the RPO) is not the only way in which RPOs reduce risk. RPO members consider they face lower risk as they have access to commercialization agreements, which set prices *ex ante*, reducing price volatility. Banks also consider RPO members to be less risky. For instance, the director of the local public bank mentioned being more likely to offer credit in areas that are more organized, as this lowers the overall risk of granting credit.

The second RPO interviewed in Sapuyes was El Bosque. This organization is young and small (2 years, 27 members), but was already considerably successful. Members of the RPO drafted a proposal for a new productive project and applied for resources from public agencies. With these, they built a chicken shed, and started to sell poultry. The members re-invested all of the income obtained from these sales to start another productive project (a strawberry plantation). However, the investment requirement was higher than their resources, so they decided to request an associative credit from a microfinance institution. This was granted directly to the RPO, rather than to its individual members. The leader of the RPO mentioned they opted for associative credit from a microfinance institution rather than from a formal bank as they needed a relatively small credit (while formal associative credits are quite large). Moreover, despite being more expensive, the requirements of the microcredit institution were substantially easier to fulfil, so transaction costs were lower.

Both RPOs interviewed evidenced high degrees of collective action. Members were well informed about the functioning of the organization. They were committed to their joint responsibility and were proactive, meeting frequently and working collectively. For instance, regarding RPO meetings, one member of Prolesa mentioned that “everyone has to go, or if we have to work one day, everyone goes. Sometimes some work more, but at least we are united”. I also found that in both RPOs, members are committed to long term productive purposes, and thus they are willing to invest money in the RPO, and to reinvest its profits in order to continue growing. The success of RPOs in the municipality does not seem limited to these two cases. According to the Secretary of Government, local RPOs have in general advanced in their productive projects and “have had a lot of will”.

The success and relevance of RPOs in the municipality is acknowledged by credit analysts. They specially highlighted the commercialization benefits these organizations generate. For instance, one of the analysts mentioned that “when the client is associated, he has a target market and his product is sold, or is more easily sold, whereas a non-member, well, it is not as easy”. He also highlighted that through individual credits, RPO members are able to access substantive resources required for large productive projects “most of our clients which are part of RPOs are small, they would not be able to pay for a \$200 million credit, but together they can do it: adding individual credits for a large project”.

This case study evidenced that RPOs can be managed quite successfully as collective enterprises following production and commercialization objectives. Through these

organizations members have been able to start new productive projects (e.g. strawberries), to access resources from public programs (e.g. to build the milk tank) and to improve their commercialization opportunities (e.g. through collective commercialization agreements). This has increased the income of members, allowing them to sell their produce at a higher price and with a lower volatility. The case also illustrates how informal credit can be used as a complement for formal credit, being an option to pay for formal credit obligations in cases of low liquidity. Credit analysts reported to be aware of these advantages, and also highlighted how through individual credits, members are able to gather resources for larger collective projects.

### **3.5.3 Guadalupe, Santander (off-the-line)**

Guadalupe is a small municipality located in the mountains of the south of Santander. It has a population of 5.000, and a poverty rate of 61%. The population has decreased by 40% since 1985, partly due to scarce economic opportunities. The municipality has low homicide rates, and was less affected by the armed conflict than other municipalities in the department. The participation of agriculture in the GDP is relatively low (14%), while tourism has become an important economic activity, receiving both foreign and national tourists.

The number of credits per capita in Guadalupe is significantly higher than the country's average. During the period of study, almost 3.000 credits were granted (twice as much as in Betulia, which has a similar population and is located in the same department). An agronomist who works in Guadalupe considers that the dynamism of the credit market relates with its closeness to Bogotá, the scarce public order problems and the fact that most people own their land. The main financial actor in the municipality is the public bank, granting 91% of the credits during the period of study, mainly to small farmers. In addition to the public and commercial banks in the area, Guadalupe has its own financial cooperative, Multicoop. This financial cooperative started as a regular RPO, being an example of how collective action organizations evolve, and of how they effectively increase the supply of credit at the local level.

Guadalupe experienced a boom in agricultural credit between 2004 and 2009, while provision has decreased since then. The decrease is associated with a preoccupation of the public bank with over-indebtedness, what has led it to make credit allocation stricter. Changes in credit dynamics do not appear to be explained by changes in RPO creation,

consistent with Guadalupe being an off-the-line municipality (i.e. the relation between both variables is not as predicted).

The number of RPOs per capita in Guadalupe is similar to the national average. However, as highlighted in its local Development Plan, RPOs tend to be weak. One RPO leader put it clearly “as all other RPOs in the area, the only thing that this RPO has achieved is maintaining all the paperwork up to date”. This view was shared by other interviewees, and was evidenced in the two RPOs studied.

The first organization interviewed was Asoprocagua. This RPO was created 6 years ago, with the explicit objective of accessing resources from a public program (“the cocoa rout”) which specifically required beneficiaries to be organized. This program acted as an external stimulus for the creation of this and other RPOs. Through the RPO, members received cocoa seeds from the government, but some of the members have not cultivated them, while others cultivated them at inadequate land conditions. Apart from receiving these resources, the organization has achieved little. This is partly due to a lack of commitment from its members since the beginning of the RPO. As one of them put it: “the link was of a quote-unquote “association”, but we did not establish any compromises, no maintenance fee, no follow up, no meetings, we only had a certificate to say “yes, we are organized” and then obtain the benefit (...) the aim was not to generate benefits for the future, just for the moment (...) that is the problem of the rural sector, the lack of an associative culture”. From the 18 members of this RPO, only 8 are active. The lack of interest might result from members being dedicated to other activities, not principally agriculture, what reduces their incentives to invest time and effort in the RPO. The leader of this organization stated that he has tried to find projects and technical assistance, but members do not even attend meetings. Related to credit, he mentioned that he once proposed getting an associative credit, but the idea was rapidly rejected by the other members, arguing it would be too risky, as no one would respond with the joint quotas. Some of the members of this organization have requested individual agricultural credit, for individual independent projects.

The second RPO interviewed was Amar. It was created 17 years ago, with 12 female members. This RPO also emerged as the result of an external influence, in this case, that of a religious organization from another municipality. As Asoprocagua, this RPO did not establish clear collective action rules or productive objectives. The leader of this RPO complained about the lack of interest and collaboration among members, what she considers has to do with receiving top down benefits “when the government started gifting

things, the action of people ended, collaboration ended. The world got out of hand. People no longer want to work or contribute”. To what she added “we put our hands out to receive, but we do not want to give anything ourselves (...) if there are meetings, people do not even come if they are not promised to receive a benefit”.

Regarding credit, one of the members mentioned they once evaluated requesting one to start a collective poultry project. However, they rejected the idea as it required too many documents and it was too risky: “we said no, it is too difficult, and there needs to be compromise, a sense of belonging. And maybe some of us are hard-working, but not of all of us are committed”.

The weakness of RPOs does not appear exclusive to these two cases. One of the leaders interviewed stated that “most of the RPOs in the municipality are all fallen apart”. During the interviews examples of other weak RPOs in the municipality were mentioned. One was the case of an organizations that was created to receive machinery to roast coffee through a public program, but then “the RPO leader started kicking out members, and he kept everything”. In another RPO, the organizations requested a credit and then the leader took all the money and left. These negative experiences (which were not reported in other municipalities) plausibly weaken trust on RPOs and lessen the motivation of people to create and join this type of organizations. Indeed, several interviewees highlighted the prevalence of individualistic attitudes in the municipality, the lack of trust and the lack of experience working in groups. These traits can be categorized as low social capital.

The interviews with the banks revealed that they are aware of the weakness of RPOs in the municipality, and thus they are sceptic of them. For instance, the director of the public bank branch said “Guadalupe does not have a culture of associativity, sadly one has to say so”. The credit analyst of the local financial cooperative considered that being an RPO member does not provide relevant information for the credit analysis as “there can be members of for example, Asogasur, which is the livestock association of Guadalupe, that anyway have a bad production management. And one person that is not in the association, but has a good management. So anyway we analyse this in the visit to the client’s farm. The visit is what tells us how the producer is”.

An agronomist who works analysing productive projects for credit applications in this and other municipalities, did have a positive view on collective action reducing credit constraints, specifically through lower risk. He stated that RPOs usually “have a technician supervising the crop, the adequate fertilizing plans, plague control (...) they

have technical assistance guaranteed and have their commercialization better programmed. So a farmer that is part of an RPO, will surely have lower risks”. Note that his view was more general on RPOs, rather than on the specific ones in Guadalupe.

The results of this case study reveal that not all RPOs are successful or have a strong impact on access to input, output or credit markets. The cases illustrated how organizations that emerge inorganically (i.e. from external influences) following short term purposes, face structural obstacles and remain weak throughout time. Because the organizations are weak, so is the relation between collective action and access to credit. This was reported by both RPO members and credit analysts.

#### **3.5.4 Guaitarilla, Nariño (off-the-line)**

Guaitarilla is located 72 km south of Pasto, the capital of Nariño. It has a population of 12.011, of which 69% is rural. Guaitarilla is now a peaceful municipality, although there was guerrilla and paramilitary presence in the early 2000s. Poverty levels are higher than in the other analysed municipalities, although the town has recently grown and access to public services has improved.

The number of agricultural credits granted per capita in Guaitarilla is almost the same as in the other off-the-line municipality (Guadalupe), being significantly higher than the national average. Most of the credits are granted by the public bank, which is the only bank in the municipality. The public bank has been in the municipality for decades, what, according to one of the interviewees has “generated a culture of credit”. Farmers interviewed reported credit being easy to obtain. One of the credit analysts mentioned that people in the municipality are good payers, and that credits are usually granted against land: “it is common for farmers to go to the bank and say “how much will you lend me with the land I have?”

The number of RPOs per capita in Guaitarilla is slightly higher than the country average, although the difference is not statistically significant. The number of RPOs has increased in the last years, especially in 2014, when 15 RPOs were created, constituting an “RPO creation shock”. As in Sapuyes, this relates to the 2013 national agrarian riot, which was particularly strong in this department. The increase in RPOs in the municipality also relates to the arrival of a public technical assistance program which encouraged producers to organize.

The local government has also incentivized RPO creation. The Secretary of Agriculture reported helping farmers to constitute RPOs, and mentioned the local government subsidizes the annual fee to renovate the RPO register, helps them prepare tax reports and structure projects, and grants them financial resources. The above evidences a top down, inorganic approach to the creation of collective action organizations, similar to what I found in the other off-the-line municipality (Guadalupe).

A second and related similarity with Guadalupe is that RPOs tend to be weak, and thus the existence of registered RPOs does not necessarily reflect or materialize collective action. There are 40 registered RPOs in the municipality, but according to the agronomist who works for the local Government and in the agricultural input store, only about 15 are doing well, despite the government supporting all of them. The weakness of RPOs in the municipality was brought up in other interviews. One person mentioned the particular problem of leaders taking advantage of the organizations (this was also mentioned in Guadalupe). Another interviewee reported his experience with other farmers in his area: they had unsuccessfully tried to constitute an RPO three times, but there was never enough commitment.

I interviewed two RPOs in Guaitarilla. The first was El Sol, created in 2014 with 28 members. It started as a cooperative to repave two kilometres of road, but then became an RPO. The leader mentioned the organization is conceived as a way of protesting against the government, and of “looking for any resource from the Government”. The RPO received potatoes seeds and inputs through a public program targeted at organized farmers. The leader argued they lost all of the production. Nonetheless, one of the members interviewed mentioned they did sell the potatoes, but she did not know why the members had not yet received money from the sale.

In general, this RPO did not appear to be very horizontal or open. In fact, the RPO leader did not agree to provide the contact details of other members, and only introduced me to his son and niece (who were also members). Regarding credit, the RPO leader mentioned that their current goal is to become a credit organization, so that members do not have to go to banks. Interestingly, the other member interviewed was not aware of this goal. The RPO leader also reported receiving several agricultural credits, but individually, and for projects not related to the organization. Furthermore, he reported that when requesting the individual credits, he did not mention being an RPO member. He added that he did



not think this was a relevant issue: “I do not think that [being an RPO member] matters, it depends more on the capacity of each client”.

The interviews with local credit analysts were consistent with the above assessment. When asked about whether RPO membership was something banks considered when assessing a credit request, one of the credit analysts replied “The truth is that RPOs here are not up to date, having their output contracts. The truth is that does not give us much information”. Similarly, the manager of the local credit cooperative replied “It does not matter, no. What matters is the collateral, the co-signer. Unless the RPO co-signs the credit, it is the same”.

Despite the general view on the weakness of RPOs, some interviewees highlighted the case of one successful RPO. I interviewed members from this organization, which was created in 2011 with 32 members. The RPO currently produces 28.000 kilograms of tomatoes per week. Members produce individually, but receive technical support and commercialize through the organization. This RPO differed from others in the municipality in that it was clearly a production and long term-oriented organization. Farmers created the RPO so they could meet the requirements of a commercialization agreement that one of them found, requiring a large amount of production, constantly throughout time. This requirement could not be guaranteed unless farmers organized.

When asked whether they had accessed associative credit, the RPO leader replied “the bank has offered us [credit] but we have still not needed it, because we have had the way to meet our needs”. Indeed, the RPO has been successful in generating income from its sales, and has also been successful at structuring productive projects to receive funds from public agencies. These resources have been substitutes for credit needs. The members have, however, applied for credit individually, especially when they began to produce tomatoes and required resources to finance initial investments. The leader of this RPO also highlighted the existence of peer effects (among members) in credit requests. For instance, he mentioned he motivates members of the RPO to request credit, stressing his example, and more specifically, that he was able to request the credit easily, and to repay it after just one crop.

Another similarity between this and the other off-the-line case is that both municipalities have experienced non-agricultural shocks and a declining relevance of agriculture as an economic activity. In the case of Guadalupe, the non-agricultural shock was the

emergence of tourism. In the case of Guaitarilla, it had to do with resources and projects brought along by local politicians and contractors who have become relevant actors at the national level. An especially relevant case was that of the Solarte brothers (huge national infrastructure contractors), who each year reward their hometown with a project. The latest project was an agreement with a large national university to open a local branch in Guaitarilla, which includes the building of student housing and other services. The interviewees highlighted this ongoing project has significantly changed the town.

The relation between RPOs and access to credit in this case study was in general weak. This appears to be the result of the weakness of RPOs in the municipality, as some organizations lack long term productive purposes and cooperative links. This weakness seems to be related with the way in which organizations emerge, following an external inducement rather than a bottom-up production-oriented initiative. The study of a particularly successful RPO in the municipality revealed that RPOs have substitute sources of investment, such as their own profits or public resources targeted towards organizations.

### **3.6 Discussion**

This section discusses the results, and builds an analytical framework explaining the demand and supply-side mechanism through which collective action reduces credit constraints. These mechanisms were identified mostly from the on-the-line cases (Betulia and Sapuyes), being largely consistent in both. Considering that these cases were selected semi-randomly, and that the municipalities are located in different areas of the country (exhibiting differences in geographic, economic, demographic and social conditions), there are no theoretical or empirical reasons why the mechanisms identified would be specific or valid only in these cases. Note that the different mechanisms are not understood as rival explanations, but rather as complementary channels explaining the relation between the dependent and independent variables.

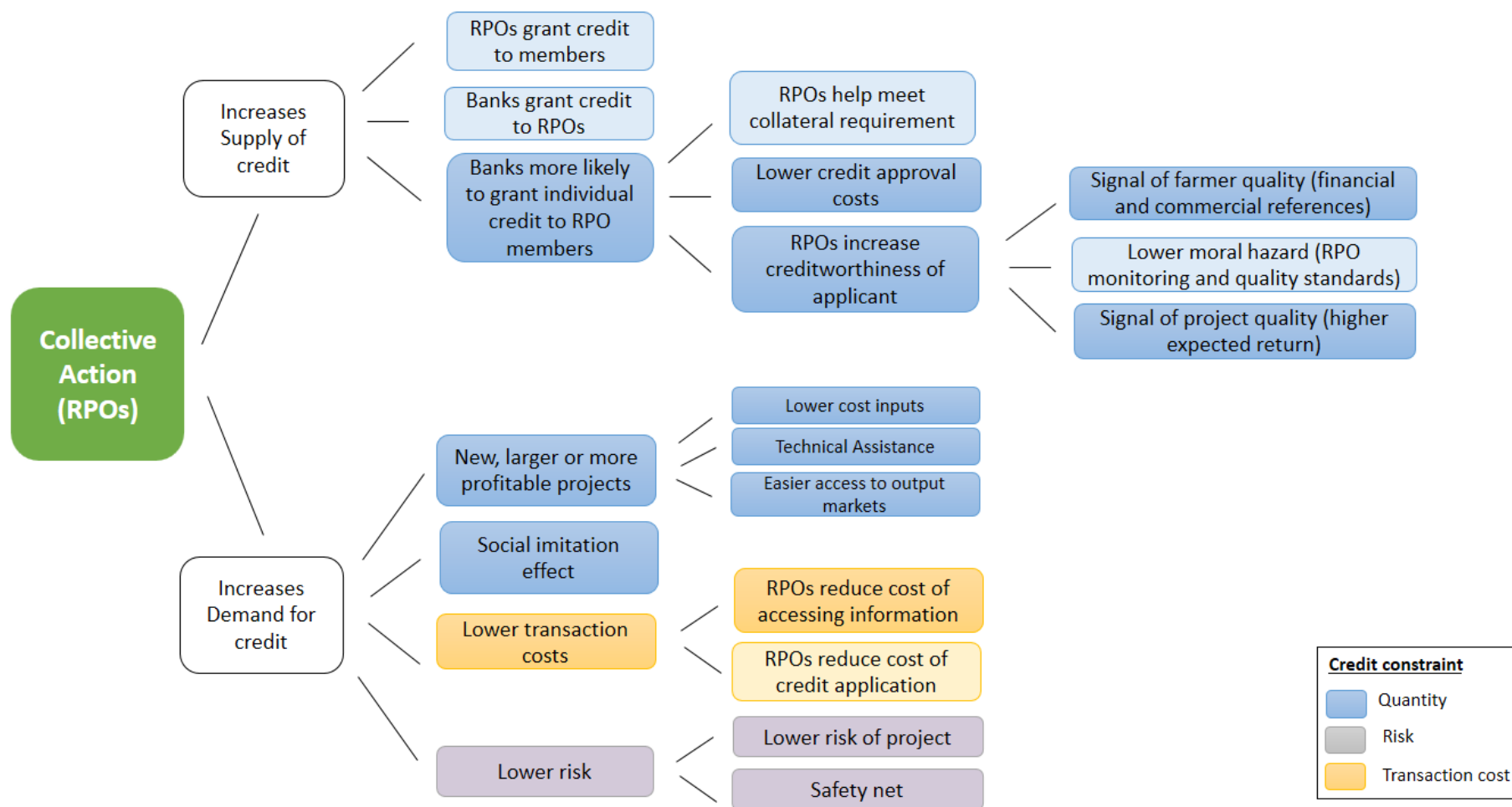
The second part of the discussion focuses on the off-the-line cases, identifying commonalities which appear to explain the low fit of the econometric model, and thus, the weakness of the mechanisms. These potential explanations are discussed from a theoretical perspective. I then carry out further quantitative analysis in order to test whether the findings drawn from the case analysis can be generalized to other cases.

Figure 3.2 summarizes the analytical framework. It describes the demand and supply side mechanisms through which collective action reduces different types of credit constraints (identified through different colours). The diagram also illustrates which mechanisms were found to be relatively stronger than others, what is depicted using different colour intensities: a higher intensity means the mechanism is stronger. As previously mentioned, quantity credit constraints refer to those which make the supply of credit lower than the effective demand. In turn, transaction cost and risk constraints refer to demand-side constraints which reduce the effective demand for credit<sup>121</sup>.

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<sup>121</sup> As such, constraints stemming from supply side costs like approval costs or client search costs, are not categorized as transaction cost constraints but as quantity constraints.

**Figure 3.2. Supply and Demand side mechanisms through which collective action reduces credit constraints**



### 3.6.1 Increasing the supply of credit

Collective action in the form of RPOs increases the supply of credit, and through this, it loosens quantity credit constraints. The three main mechanisms through which this occurs are: a) RPOs grant credit to their members; b) Banks grant associative credit to RPOs; and c) Banks are more likely to grant individual credit to RPO members.

#### *a. RPOs grant credit to their members*

Several RPOs grant credit to their members through informal group lending schemes, increasing the supply of credit. RPO credits tend to be small, mainly because the resources available to lend are limited to contributions made by members. They also tend to be more expensive than formal credit, which is subject to regulations like interest rate ceilings. Credit granted by RPOs acts as a selective incentive (i.e. private goods made available to individuals on the basis of whether they contribute to a collective good).

The case studies revealed that RPO credits are in general demanded for emergency needs<sup>122</sup>, including paying formal credit quotas in periods of financial hardship. As such, RPO credit does not only reduces quantity constraints through the provision of informal credit, but also reduces risk constraints, acting as an informal insurance for accessing formal credit. Furthermore, that RPO credits are small and mostly used for emergencies suggests that these are a complement, rather than a substitute of formal credit. This is consistent with evidence showing that low-income individuals simultaneously use both informal and formal sources of finance (United Nations, 2006).

#### *b. Banks grant associative credit to RPOs*

Associative credit refers to credit offered by banks to RPOs<sup>123</sup>. By regulation, this credit line offers lower interest rates than standard individual credit, being an incentive for farmers to organize. Only when a farmer becomes member of an RPO, he becomes eligible to access this special and favourable credit line. This reduces both quantity constraints and price constraints.

Despite the potential of this mechanism to reduce quantity constraints, the case studies evidenced this mechanism is rather weak. For instance, while all RPOs interviewed

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<sup>122</sup> Another type of credit that RPOs can offer (although it is not very common) is credit to purchase inputs from the RPO's input store.

<sup>123</sup> That is, credit granted directly to the legal organization. There was a recent reform stating that associative credit conditions also apply for individual credit for RPO members, but this information was not known locally.

reported banks offering them associative credit, none of them had accessed this credit line<sup>124</sup>. The interviews revealed there is a low demand for this credit line due to its nature: associative credits are quite large<sup>125</sup>, and few RPOs have the capacity or even the need to request large credits. The above, as either RPOs are too small and unsuccessful, or they are successful and are able to meet their investment requirements re-investing income or through resources received from public programs. Moreover, the requirements for accessing this type of credit are complex (e.g. all RPO members have to be well reported in credit history databases), and there are intrinsic collective action transaction costs (all members have to agree to request the credit), and collective risk constraints (members fear others will not pay their share of the collective quotas).

*c. RPO membership increases the likelihood of credit supply*

Benson et al.'s (2019) econometric results show that banks are 1,2 times more likely to supply a credit to a farmer who is an RPO member relative to one who is not. The case studies reveal this stems from RPO membership increasing the creditworthiness of farmers. Creditworthiness (or credit scoring) relates to the estimated plausibility of an individual defaulting on debt, what is assessed based on project type (i.e. the expected return of a productive project) and farmer type (i.e. expertise, commitment, ability). RPO membership provides a signal of both project quality and farmer type, making farmers more creditworthy and reducing the prevalent problems of imperfect and asymmetric information present in rural markets.

RPOs provide a signal of project quality, for instance, granting commercial references for credit applications<sup>126</sup>. Moreover, banks are aware that through these organizations farmers have access to inputs at lower prices, commercialization agreements, technical assistance and other forms of government support. The above translates into higher expected returns of their productive projects, as will be further discussed in mechanism d. Evidence from a recent survey is consistent with the above: credit suppliers state that

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<sup>124</sup> This is consistent with the fact that associative credit accounts for less than 1% of all agricultural credit in Colombia.

<sup>125</sup> In the Colombian case, these credits are of over \$200 million COP, whereas the average credit size a small farmer requests is \$8 million COP.

<sup>126</sup> I found that some credit request forms explicitly ask whether the farmer is an RPO member. In other cases, this information is brought up during the application interview or the bank's visit to the farm. Other credit analysts argued they know *ex ante* which farmers are RPO members, for example, because RPOs have savings accounts in the bank, or just because information of this sort flows easily, especially in small municipalities.

producers with higher access to credit are those who face lower risk, usually being those which are more organized and have access to better information, price guaranteed schemes and secured output markets (Econometría and M. Consultores, 2014).

RPO membership also provides a signal of farmer type, not only through commercial references, but also through financial ones. Reference signal farmers' experience producing a certain type of product, and show that the farmer has a relevant credit history with the organization. RPO references serve as a screening mechanism<sup>127</sup> that reduces problems of imperfect and asymmetric information.

While banks did not explicitly report RPOs reducing moral hazard problems (e.g. carrying out monitoring tasks which banks cannot overtake), in practice, this does occur. For instance, leaders of RPOs monitor the crops of members, as well as the quality of the final products, setting quality standards for joint commercialization.

Another way in which RPOs increase the likelihood of credit supply is through the reduction of search and approval costs (i.e. transaction costs from the supply side). Banks reported visiting RPOs to offer their members credits in a block, this entails lower search costs relative to contacting clients one by one. This also reduces approval costs. For example, credit revision costs are offered at lower rates when several similar productive projects (e.g. those of members from a certain RPO producing similar products under similar conditions) are analysed. That RPO membership reduces search and approval supply costs is particularly relevant, as one of the reasons why commercial banks report not supplying sufficient agricultural credits is that these tend to be small, making fixed approval costs too high. As discussed by the United Nations (2006), increasing access to financial services for unbanked and underbanked individuals requires not only innovation in products, but also innovation in the means of reaching customers, including achieving economies of scale in serving small transaction credits.

A final way in which RPO membership increases the likelihood of credit approval is by helping farmers to meet collateral requirements, for instance, through jointly acquired or rented land or other assets. The case studies revealed this mechanism to be weak. First,

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<sup>127</sup> The work of Markussen and Tarp (2014) shows that the screening applicants, for example, through the provision of a letter of recommendation, increases access to credit.

as not all RPOs own collective assets; and second, as those that do, consider it too risky to use it as a collateral and losing it.

### **3.6.2 Increasing the demand for credit**

Collective action also increases the demand for credit, what in a context in which the supply is flexible, leads to a reduction in quantity credit constraints. The mechanisms through which RPOs increase the demand for credit are: d) increasing access to new, larger and more profitable productive projects which require investment; e) social imitation effect; f) reducing transaction costs by easing access to information on credit opportunities and the application process; and g) reducing risk constraints by constituting a safety net.

#### *d. RPOs increase access to new, larger and more profitable productive projects which require investment*

Collective action in the form of RPOs increases the demand for individual credit as it allows members to access new, larger and more profitable projects. This goes in line with Gine's (2011) model of investment decisions depending on scale of production and ability. RPO members have access to new projects (e.g. proposed by the organization leaders, or which arrive through public programs particularly targeted towards RPOs). Public programs often require beneficiaries to make a counterpart investment, as such public resources act as a complement for credit<sup>128</sup>. RPOs also increase the demand for investment and credit at the intensive margin, by enlarging productive projects (for which investment is needed). More generally, RPOs increase the demand for credit by making projects more profitable. The above increases the expected return of investments, increasing the demand for credit.

A first channel through which RPOs increase the profitability of projects is that RPO members are able to access inputs (from seeds to machinery) at lower prices. This, as the organizations buy large quantities directly from suppliers, skipping intermediaries and profiting from economies of scale. In some cases, RPOs receive inputs at zero price, through targeted public benefits.

RPOs also receive technical training from public programs, NGOs, multilateral agencies, second level RPOs and input suppliers. Through these, members access training in Good

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<sup>128</sup> Public resources can also act as a supplement for credit, if they are enough to start a project or if beneficiaries are not required to make a counterpart investment.



Agricultural Practices, book keeping, commercializing strategies, and even leadership and human relations. Technical assistance programs also teach members how to process and add value to their products, which allows receiving a higher revenue. Sometimes technological transfer occurs not through external assistance, but directly among RPO peers (e.g. through Whatsapp groups).

Collective action organizations also ease access to output markets through joint commercialization agreements, though these, they skip intermediaries who often have monopsony power and thus pay low prices. Also, output contracts (or agreements) can include quality standards for the product, for which farmers are paid a higher price. The above is in line with previous evidence on the positive impact of collective action organizations on commercialization (Markelova et al. 2009; Bernard, Taffesse, and Gabre-Madhin, 2008).

The advantages that RPOs provide for accessing information (e.g. on how to fight a pest), technical assistance (e.g. Good Agricultural Practices or risk prevention strategies) and commercialization (e.g. setting *ex ante* commercializing conditions) should reduce the risk of productive projects, what in turn, increases their expected return.

*e. The demand for credit increases through a social imitation effect*

The influence that peers exercise on the behaviour of individuals is known as a social imitation effect. In the case of credit, it refers to peers influencing the decision of an individual to request a credit. In the cases studied, this occurred when RPO leaders actively motivate others to follow their experience. The work of Wydick et al. (2011) shows, for instance, that when the number of people in a church who access microfinance doubles, the probability of an individual accessing credit increases by 14% (the effect on formal credit is small although significant). The imitation effect generated by RPOs is plausibly larger, being a specialized production-oriented network, which can provide more relevant information or role models than informal social networks like churches or neighbours.

*f. RPOs reduce transaction costs of credit applications, by easing access to information on credit opportunities and the application process*

RPOs also reduce transaction cost credit constraints. This, as the organization constitutes a network through which information flows. The diffusion of information about credit opportunities operates among RPO peers, constituting what banks call the "voice to voice" mechanism. This goes in line with the results of Okten and Osili (2004) showing

that social networks (measured as participation in community meetings) increase the probability of knowing about credit opportunities, of applying for credit and of receiving one. The flow of information among RPO members can be particularly relevant as they are engaged in similar activities, with plausibly similar credit needs. This makes information more pertinent.

*g. RPOs reduce risk constraints, acting as a safety net*

RPOs also reduce risk credit constraints. This is not only related to RPOs reducing the potential risk of productive projects (as discussed in mechanism d), but also to RPOs constituting a social network that can act as a safety net. For instance, farmers reported that when a member faces an adverse shock and has problems to pay a formal debt, peers can provide an informal loan (RPO to peer or peer to peer). Having access to this safety net should reduce the risk of defaulting on debt and losing the collateral. The above is similar to the argument of Guirking and Boucher (2008) on how transfers from families or friends reduce risk credit rationing.

### **3.6.3 Explaining the low fit of the model in the off-the-line municipalities**

The mechanisms through which collective action reduces credit constraints were found to be weak in the off-the-line cases. This could be the result of idiosyncratic aspects in each of the two cases; alternatively, it could result from common characteristics in the way in which RPOs or the credit market operate in these. I found evidence of the latter: there are commonalities in both off-the-line cases which appear to explain the low fit of the model. I then show these commonalities are generalizable to a larger set of municipalities. As such, they explain in a more systematic way why under certain conditions the effect of collective action on access to credit is not as strong as predicted by the econometric model.

The principal commonality found was that while in the off-the-line municipalities the number of RPOs per capita is not statistically different from the average, *de facto*, RPOs tend to be weak and do not effectively materialize collective action<sup>129</sup>. As a consequence, the relation between CA and credit is weak.

The above leads to a question: why are RPOs in these municipalities relatively weak? The qualitative analysis revealed that the strength and success of RPOs is related to the way

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<sup>129</sup> This would constitute a sort of “measurement error”. As discussed in the case study section, this was especially true for the case of Guadalupe.

in which they emerge. Successful RPOs tend to emerge organically: as bottom-up initiatives aimed at working jointly towards long term productive purposes. On the contrary, unsuccessful RPOs tend to emerge inorganically: following an external, top down, short term stimulus, often leading to “RPO creation shocks”. One example of an external stimulus was the arrival of a specific public program requiring beneficiaries to be organized in order to receive a short term benefit. Incentivized by this stimulus, farmers constituted organizations rapidly, without defining clear productive purposes or collective action rules. These RPOs are active at the moment of receiving external support, and then turn into passive actors.

These external stimulus leading to “RPO creation shocks” were more common in the two off-the-line case studies<sup>130</sup> than in the on-the-line ones. Furthermore, I show they were more common in the off-the-line subgroup of municipalities. To show this, I estimate the number of “RPO creation shocks”<sup>131</sup> experienced in each municipality and then carry out a difference-in-means test. I find that the number of shocks in the off-the-line municipality subgroup is statistically higher than in the rest of municipalities.

To more formally test whether this relates to the low fit of the model (of Benson et al. 2019), I estimate this model on a subsample of municipalities: those with the highest number of “RPO creation shocks”<sup>132</sup>. The results in Table 3.3 show that indeed, the model does not fit in this subgroup of municipalities: contrary to the aggregate results, the effect of CA on access to credit is not significant in this subsample.

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<sup>130</sup> In Guadalupe, the external stimulus was the “cocoa route” public program. In Guaitarilla, the external stimuli occurred after the agrarian riot of 2013 and with the arrival of a special technical assistance program which encouraged producers to organize.

<sup>131</sup> A shock is defined as a case in which the number of RPOs created in a municipality during a given year, is more than twice the average number of RPOs created in that municipality annually.

<sup>132</sup> Those in the decile of highest shocks

**Table 3.3. FE estimations for municipalities in the decile of high RPO shocks**

Dependent variable: VARIABLES	Number of credits (1) (1)	Value of credits (2) (2)
RPO (per thousand rural inhabitants)	1.570 [6.285]	-0.491 [0.281]
Rain shock (cms)	0.010* [0.006]	-0.000 [0.000]
Lag Local fiscal revenue (per capita)	0.569 [0.903]	0.733*** [0.093]
Lag National transfers (per capita)	21.608** [10.212]	-0.334 [0.476]
Lag Homicides (per capita)	0.597 [1.707]	0.050 [0.093]
Constant	-15.357 [19.358]	0.727 [0.936]
Observations	521	521
R-squared	0.738	0.681
Number of Municipalities	56	56
Municipality FE	YES	YES
Year FE	YES	YES
Department-year FE	YES	YES

Robust standard errors in brackets, clustered at the municipality level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All monetary variables in real terms. Homicides per capita in logs. Estimations exclude the five principal cities in the country. Specifications with only municipality fixed effects, with municipality and year fixed effects, and with region-year fixed effects generate similar results.

Note that the existence of “RPO creation shocks” is not a fixed underlying municipality trait, but rather a dynamic that occurred in one context with a higher frequency than in others (for reasons that can be structural as well as random)<sup>133</sup>.

Another dynamic that was observed in both off-the-line cases, and which can explain the weakness of RPOs, was that these municipalities experienced booms in non-agricultural economic activities<sup>134</sup>. The emergence of alternative sources of income lower the relevance of agriculture as an economic activity<sup>135</sup> in the municipality. This plausibly reduces the incentives of farmers to invest time and effort in making RPOs successful. To analyse if this systematically relates to the low fit of the econometric model, I run the

<sup>133</sup> Understanding the reasons behind RPO creation shocks are a topic of further research.

<sup>134</sup> In Guadalupe, a boom in tourism. In Guaitarilla, a boom in private investment brought along by the Solarte contractor brothers.

<sup>135</sup> The participation of agriculture in the municipality GDP is especially low in Guadalupe, where agriculture represents only 14% of GDP, while in the on-the-line municipalities it represents between 30% and 50%.

main model restricting the sample to the decile of municipalities in which the participation of agriculture in the GDP is the lowest<sup>136</sup>. Table 3.4 shows that consistent with the hypothesis, the effect of CA is not significant in this subgroup of municipalities, that is, the model does not fit.

**Table 3.4. FE estimations for decile of low share of agriculture on the GDP**

Dependent variable:	Number of credits per capita	Value of credits per capita
VARIABLES	(1)	(2)
RPO (per thousand rural inhabitants)	1.473 [1.661]	0.069 [0.125]
Rain shock (cms)	0.001 [0.002]	0.000 [0.000]
Lag Local fiscal revenue (per capita)	-1.648 [1.146]	0.637*** [0.197]
Lag National transfers (per capita)	9.765 [11.853]	-0.772 [0.655]
Lag Homicides (per capita)	0.634 [0.749]	-0.003 [0.057]
Constant	14.963** [6.400]	-0.317 [0.693]
Observations	1,176	1,176
R-squared	0.411	0.394
Number of Municipalities	108	108
Municipality FE	YES	YES
Year FE	YES	YES
Department-year FE	YES	YES

Robust standard errors in brackets, clustered at the municipality level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All monetary variables in real terms. Homicides per capita in logs. Estimations exclude the five principal cities in the country. Specifications with only municipality fixed effects, with municipality and year fixed effects, and with region-year fixed effects generate similar results. Data on agricultural and total GDP only available from 2002 to 2009, thus the decile is estimated based on data for this sub period.

The third commonality identified among the two off-the-line cases does not have to do with the way in which RPOs operate, but rather with the way in which agricultural credit does. I found that in both off-the-line municipalities, access to credit is particularly high: the number of credits per capita is more than three times that of the on-the-line cases or the average Colombian municipality. This suggests that in these municipalities, credit constraints are not as binding as in others, reducing the potential of CA in loosening them.

The question that stems from this is: why is access to credit particularly high in these municipalities, despite benign located in different regions and climates and exhibiting significant differences in population, poverty and GDP levels? A credit analyst in

<sup>136</sup> Excluding cities. Data on agriculture and total GDP is only available for a subset of years (before 2009), and thus this variable cannot be included as a control in the econometric model.

Guadalupe mentioned that one of the explanations for the dynamism of credit in the municipality is that most people own their land<sup>137</sup>. Similarly, in Guaitarilla a credit analyst mentioned that farmers usually approach the bank asking how much credit the bank grants for the land they have. Formally owning land implies that farmers have assets they can use as collateral for credits, what increases their chances of having credit allocated by banks. This is known as the collateralization effect or the “*de Soto effect*” (Besley, Burchardi and Ghatak, 2012). In addition to the above, the authors show that having formal land property rights increases investment (and thus the demand for credit) through the assurance effect, which arises as farmers feel more secure about being able to maintain their right over property for a longer term, increasing the return on long term investments.

To further analyse this, I estimate the levels of land informality in both off-the-line cases. I find that indeed, it is significantly low in both: 2% in Guadalupe and 3,2% in Guaitarilla, compared to an average of 20% at the national level. More broadly, land informality is low (12%) in the off-the-line subgroup as a whole. In order to formally analyse whether land informality conditions the effect of collective action on access to credit, I run the main econometric model on the subgroup of municipalities in the decile of lowest land informality rates<sup>138</sup>. As shown in Table 3.5, the effect of RPOs is not statistically significant in this subgroup of municipalities<sup>139</sup>. The above implies that in contexts in which land informality is low<sup>140</sup>, and thus farmers are more likely to own land and experience an assurance and a collateralization effect, the role of CA in further loosening credit constraints (e.g. by enabling farmers to collectively access land, or providing a network of co-signers of credit) is less relevant. This result is consistent with the view of collective action being more important in contexts in which market and state failures (e.g. weak property rights) are more salient. Note that this does not imply that some municipalities have an underlying and fixed propensity for strong collective action, but

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<sup>137</sup> He also mentioned being close to Bogotá (but this is captured in the municipality fixed effect) and public order being safe (which is captured in the homicide rate control variable). In Nariño, a credit analyst mentioned something similar, he argued that the quality of land explained why the credit market was better in Sapuyes (on-the-line) and Guaitarilla (off-the-line).

<sup>138</sup> Data on informality rate is not available for every year or every municipality, and thus it cannot be included as a control variable in the panel model.

<sup>139</sup> As a robustness test, the model was run for the quintile (not decile) of low informality municipalities. The results are consistent.

<sup>140</sup> Land informality can be low for both structural (e.g. historic state presence) or random reasons (e.g. the arrival of a land titling campaign). Again, exploring the reasons behind this constitutes further research.

rather that the context (in time and space) or organizational environment in which an organization emerges, affects its nature<sup>141</sup>.

**Table 3.5. FE estimations for decile of low land informality**

Dependent variable:	Number of credits per capita	Value of credits per capita
VARIABLES	(1)	(2)
RPO (per thousand rural inhabitants)	-0.086 [0.786]	1.084 [0.672]
Rain shock (cms)	-0.001 [0.002]	-0.000 [0.000]
Lag Local fiscal revenue (per capita)	-2.501 [1.758]	-0.103 [0.177]
Lag National transfers (per capita)	39.836*** [12.839]	-0.653 [2.519]
Lag Homicides (per capita)	1.091 [0.725]	0.087 [0.093]
Constant	11.867 [7.415]	1.595* [0.896]
Observations	1,063	1,063
R-squared	0.592	0.280
Number of Municipalities	96	96
Municipality FE	YES	YES
Year FE	YES	YES
Department-year FE	YES	YES

Robust standard errors in brackets, clustered at the municipality level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All monetary variables in real terms. Homicides per capita in logs. Estimations exclude the five principal cities in the country. Specifications with only municipality fixed effects, with municipality and year fixed effects, and with region-year fixed effects generate similar results. Results run on the decile of municipalities with low informality.

### 3.7 Conclusion

Developing the rural financial market is crucial for the agricultural sector to grow and achieve its poverty reduction potential. This requires identifying alternative ways in which credit constraints can be reduced. As shown by Benson et al. (2019), collective action is one of these alternatives. This paper builds on these quantitative findings, and through a mixed methods analysis, develops an analytical framework explaining the mechanisms through which collective action reduces credit constraints.

The qualitative analysis consisted of four case studies selected following a novel methodological approach. The methodology derives from the estimation of residuals in a

<sup>141</sup> The context and the nature of RPOs can vary within municipalities as well. For instance, the tomatoes RPO in Guaitarilla (off-the-line) emerged organically and was successful. However, on average, RPOs in this municipality tend to be weak.

Large-N Analysis, based on which cases are semi-randomly selected to carry out the Small-N Analysis. This approach reduces concerns of biases in case selection, and also exploits quantitative data to compare cases and to discard the existence of systematic differences that can make generalizations more complicated. This methodology can be useful for scholars seeking to carry out mixed methods analysis in a more structured way, and is particularly useful for when there is a large number of potential cases, such as in subnational analysis. Furthermore, the proposed nested analysis methodology evidences the value of analysing both on and off-the-regression-line cases.

The results show that collective action in the form of RPOs reduces quantity credit constraints, as it increases the supply of credit. This occurs as RPOs grant credit to their members, and as banks grant credit to RPOs. Furthermore, banks are more likely to grant individual credit to RPO members as membership signals project quality, farmer quality and reduces search and approval costs (i.e. transaction costs from the supply side). Collective action also increases the demand for credit, allowing members to engage in new, larger and more profitable projects (e.g. they have easier access to low cost inputs, technical assistance and output markets) requiring investment. In addition to this, RPOs reduce transaction cost constraints through the sharing of information on credit opportunities and the credit application process. Finally, these organizations reduce risk constraints, constituting a safety net, especially through the provision of emergency loans.

The mechanisms explaining the relation between collective action and credit constraints were largely consistent in both on-the-line cases, but were found to be weak in the off-the-line ones. The evidence points towards this resulting from RPOs being weak in these municipalities, what in turn is associated with the way in which organizations emerge (either as an organic bottom up, collective-production-oriented strategy, or as an inorganic short term strategy to receive benefits). The identification of the mechanisms, the source of heterogeneity and the causes for low model fit was possible through the analysis of fine-grained information obtained from the interviews. This evidences the usefulness of synergistically integrating Small and Large-N Analysis for gaining causal inference. This is especially relevant when studying complex relational variables such as collective action.

Further research is needed in order to more robustly understand the sources of heterogeneity in the functioning and emergence of RPOs, providing a better understanding of the different shapes that collective action can take in arguably similar organizational forms. Further research could consider aspects of organizational structure,



organizational environment and network theories of organizations, building links with the literature on sociology and organizational theory (Di Maggio and Powel, 1983; Andrews et al., 2010; Galaskiewicz, 2007; Perrow, 1967). Further research is also required to address whether collective action has the potential of reducing credit constraints in contexts in which the formal agricultural market is less developed and credit constraints are more stringent (e.g. in African countries).

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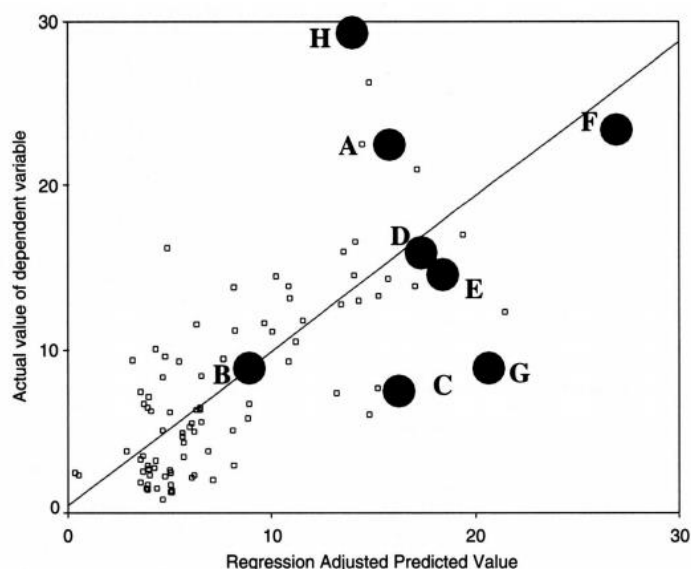
## Annex 3

### a. Methodological Appendix

#### On and off-the-regression line observations

As Lieberman (2005) explains in this graph, cases B, D, E and F are considered on the regression-line (well predicted by the model), while the rest are off-the-regression line (not well predicted by the model)

**Figure 3.A1 A graphic explanation (Lieberman, 2005)**



#### Statistically significant differences between municipalities

As shown in Table 1, from the 21 analysed variables, Sapuyes differs statistically from the average municipality only in that it has a lower homicide rate. Betulia differs in that it has a smaller population, but higher agricultural GDP and fiscal resources. The two off-the-line municipalities (Guadalupe and Guaitarilla) also exhibit overall similarities to the rest of the Colombian municipalities, although both show higher than average number of credits per capita, and Guadalupe has a higher than average GDP per capita.

Regarding the differences between the municipalities and their decile group mean, the results show again overall similarities. Moreover, the differences largely resemble those with the average Colombian municipality. Finally, comparing the on and off-the-line municipalities within each Department, the results show that for the case of Nariño, Sapuyes (on-the-line) has a smaller population, less poverty and less violence, and has less credit per capita than Guaitarilla. In Santander, Betulia has a higher population and a lower number of credits per capita.

#### Interview design

The interviews were semi-structured around the following topics:

- **The nature of collective action and RPOs.** This set of questions was directed towards RPO members and was aimed at understanding the nature of RPOs and of how CA materializes in them. Questions addressed issues like the reasons for

joining the organization, how it emerged, how it operates and how it impacts the community.

- **The demand side mechanisms explaining the impact of CA on access to agricultural credit.** These questions were also directed towards RPO members, addressing issues like past experience accessing credit (motivations to request it, the process, the risks associated) and the potential impact of CA on these.
- **The supply side mechanisms explaining the impact of CA on access to agricultural credit.** These questions targeted directors or credit analysis of the local financial institutions. They covered issues about the credit approval process, how contextual characteristics affect the supply of credit, and the relation of RPOs and banks.
- **The agricultural credit market and the potential of CA in reducing credit constraints.** These questions were directed towards national and local level policy actors and were aimed at gaining an in-depth understanding of the functioning of the agricultural credit market, and of how policy experts perceive CA can contribute to increasing access to credit.

## **b. Municipality profiles**

### BETULIA, SANTANDER

Betulia is a small municipality in the department of Santander, in the north-eastern area of the country. It has a population of 5.200, 75% of which live in the rural area. It represents 0,2% of the Department's population and 4% of its area. The municipality is poorly connected to the rest of the Department. It is 90 km. away from the Department capital (Bucaramanga), but it takes more than three hours to travel there, on an unpaved road. As a result of its geographical location and lack of infrastructure, Betulia has been historically isolated, politically and economically. This affects the livelihoods of farmers, for instance as the few intermediaries that arrive to buy agricultural products have leverage over prices.

The municipality produces most of the agricultural products that it consumes, although the fruit and vegetable market does not operate anymore, and there are only a couple of small stores in the whole town. Some products are taken to a neighbouring municipality, but the roads close when weather conditions make it dangerous to transit. Some relevant products are coffee, cocoa, cattle, maize, plantain, onions and tomatoes. The case of greenhouse tomatoes is worth highlighting. Betulia's town centre is surrounded by greenhouses, which have boomed over the last 5 years, generating some jobs and economic growth, but endangering the environment and the health of people who work there, due to close contact to pesticides which are poured into water sources. Scarce actions have been taken, in part because people in the local government have their own greenhouses, thus do not have the incentives to regulate them.

The diversity of agricultural production in Betulia is the result of varying topographic conditions. The municipality town is located in the mountains, and the temperature is mild. The other economic centre is vereda La Playa, which houses approximately 200 families near the highway that connects Bucaramanga and Barrancabermeja, next to the Sogamoso river, where the temperature is quite high. There is a marked discontent among the population of La Playa and of the municipality in general, as they have suffered from the negative consequences of a major project: a hydroelectric plant (Hidrosogamoso),

built in 2009, for which a large area of the municipality was flooded, promising to bring development and jobs. These expectations have not been fulfilled, people lost the land they owned and worked in, but did not find jobs, and many people had to emigrate. Moreover, the project brought environmental problems (the fish in the river have become scarce, the nearby roads have collapsed because of changing topographical conditions). This has united the population around their claims, being active in demonstrations against the project and the Government. The population has sued the hydroelectric for breaking environmental agreements, but this will take years to settle. Many have their hopes on this, although in the area, hopes about the future are not always optimistic. Even the priest mentioned that there is low hope.

The agricultural sector represents over 30% of Betulia's GDP, and the agricultural GDP is higher than in the average Colombian municipality. Half of the rural population is poor (under Unsatisfied Basic Needs Index), 15% of the population is illiterate, and access to post primary education is low (37%). Nonetheless, since the decentralization reforms of the early 1990's, service provision has improved, even in the rural areas, where 86% of households have access to electricity and 23% to water.

Betulia is a municipality of small (49%) and medium farmers, and although land inequality is high, the landed elite has not been as powerful as in other areas of the country. Regarding the impact of violence, Betulia experienced guerrilla presence starting in the 1990s and paramilitary presence after 2000. Betulia's proximity to the Magdalena Medio made it beneficiary of a Peace and Development Project during the first years of the 2000s, which invested considerable resources in productive projects and the reconstruction of social cohesion. Despite this, the insecurity at the time, combined with scarce economic opportunities, led to high levels of displacement and migration. The municipality has traditionally experienced high migration of young people to cities like Bucaramanga, Barrancabermeja, and Bogota. As a result, the population has not grown much during the past six decades.

The inhabitants of Betulia are friendly and hard-working, and the town feels safe and calm, with only a couple of cars transiting during the day. There are few people in the streets after dawn, when the last mass ends, and people go to their houses. Religion is an important part of daily life, and the priest is argued to be more of a leader than the mayor (who is considered by many to be self-interested and to have done little for the development of the municipality). The current security situation is stable, during 2015 there was one homicide and eight cases of robbery to people; these rates are lower than the national average.

Turning now to public finances, it is worth noting that investment increased between 2012 and 2015, as local fiscal revenue and national transfers increased, and has remained stable for the past two years. Most of the investment goes to infrastructure, health, culture and sports. Despite being a predominantly agricultural municipality, the current government has not prioritized this sector. In fact, it is the sector with the lowest investment. In fact, the Secretary of Agriculture was just created. Most of the support granted to RPOs by the local government comes from agreements with SENA or the hydroelectric plant, or through projects from the Ministry of Agriculture.

The number of credits per capita allocated in the municipality is not statistically different from the average Colombian municipality. Most credit (86%) is granted to small farmers,

13% to medium and 1% to big. This is surprising as small farmers constitute only 49% of all farmers in Betulia, suggesting that medium and big farmers tend to self-finance their productive activity. The average credit size for small farmers is \$5 million COP, for medium \$39 million and for big \$89 million. The public bank is the main provider of credit (91% of all credits), granting most credits to small farmers and some to medium ones. In contrast, almost all credit granted by banks (4% of the total) goes to medium farmers.

When speaking to the manager of the public bank, he mentioned that one problem for accessing credit is the travel costs to the bank branch, as the road conditions in Betulia are quite bad. To offset this, he visits different areas of the municipality. He also mentioned that there has been increased demand in credit, especially in the lower area of the municipality, as security conditions have improved during the last decades. He also said that there was an increase in the demand for credit due to the arrival of the greenhouse tomatoes projects (around 12 years ago). Another aspect that can impact access to credit was the introduction of a public guarantee program by the local government around 2012. The increase in credit demand is surprising, especially when considering that there has been large emigration and that in general young people are not interested in working in the agricultural sector, as the Agriculture Secretary mentioned.

Another interesting aspect is the relevance of cooperative credit in Betulia, representing 10% of all credits since 2010, when the first one was granted. The average credit size provided by cooperatives is higher than the credits provided by the public bank (\$15 million vs. \$11 million), but significantly lower than the credits provided by the private banks (\$67 million). Cooperative credit is granted by Coomultrasan, located in Zapatoca, about an hour and a half away from Betulia. Coomultrasan is the largest cooperative in the country and is one of the few that grants credit under Finagro conditions.

Turning now to the dynamics of Collective Action, although the number of RPOs per capita is similar to the country average, 25% of farmers are members of RPOs, a rate significantly higher than the average Colombian municipality. This suggests that RPOs are big, or remain unregistered. According to the Mayor, not all RPOs are successful, and that members become impatient because they want to see results fast, reason why some disappear fast. The Secretary of Agriculture mentioned that several of them have organized a federation of RPOs, and that some of the RPOs emerged as a result of the hydroelectric, they organized to demand help.

#### SAPUYES, NARIÑO

Sapuyes is located in the department of Nariño, 3.000 meters above the sea level. It is 80 km south of the department capital (Pasto). Sapuyes is quite small, covering 0,4% of the departments geographical area and population. There are 7. 300 people in Sapuyes, of which 1.200 are indigenous and 75% live in rural areas. The population has decreased in the last two decades, although not as much as in other rural areas of the country. The municipality is well connected by roads to the department capital and within a few kilometres to Túquerres, a municipality of over 40.000 people, where commercial and financial activity takes place, benefiting Sapuyes but also limiting its growth (for example, there are no commercial banks in the municipality, as people can travel to Túquerres). As a consequence, Sapuyes remains to be a small municipality with only a couple of stores, no hotels nor restaurants.



Sapuyes has been traditionally peaceful, and the homicide rate is among the lowest in the country, despite being in one of the departments most affected by the internal conflict. There are no records of captures or attacks by guerrilla or paramilitary groups, although the municipality experienced internal displacement, especially before 2009. The priest mentioned that it is a socially integrated and peaceful municipality and "that people have a lot of solidarity, if there is any situation, there are early alarms".

Poverty rates have diminished drastically in Sapuyes (and Nariño) during the last decade, reaching 36% by Unsatisfied Basic Needs measurements. The reduction in poverty rates is related with improvements in the provision of public services: access to energy is around 95% even in rural areas, and 88,7% of the population has access to water services. There is however a high qualitative housing deficit (40%), and land Gini is high despite the fact that over 94% of rural producers are small.

Sapuyes is an agricultural municipality, 56% of the GDP comes from farming and livestock and 60% of the municipality land is used for agricultural purposes. There is not a lot of topographic variation, which limits the variety of products that can be cultivated. The main agricultural products are potatoes, followed by carrots, cereals such as quinoa and wheat, maize, beans, onion. Livestock is also relevant, mainly for milk production.

As in other areas of Colombia, including Santander municipalities, the support of the local government to the agricultural sector is scarce. Local public investment in agriculture is 40 times lower than in health. The Secretary of Government explained this is due to the construction of a health centre that required a large investment. When asked about the support the local government gives to the agricultural sector, the Secretary of Government answered "what we have meant to start is with associativity". The current Mayor increased support to RPOs, but recognizes this is nonetheless insufficient. The mayor mentioned he sees RPOs as a way to reduce poverty and insecurity (by granting opportunities), although he says it has sometimes been difficult to promote RPOs and "still people refuse to work as a team".

The number of RPOs per capita is similar to the country average, although the rate of association (34% of farmers) is high, suggesting that RPOs are large or not registered. During the study period 19 RPOs were created, especially following the agrarian riot of 2013, after which farmers created RPOs encouraged by local social leaders knowing this would facilitate accessing public resources promised in the riot agreements. It is worth noting that there is a generalized discontent among the population of Nariño towards the national Government, as it has not transferred the agreed resources, and because the resources that have been transferred have not generated the expected impact.

The number of credits per capita allocated in Sapuyes is similar to the country average, although lower than the subgroup average. 75% of credits granted went to small farmers and 25% to medium ones, and 6 credits granted to big farmers. The relatively large share of credits for medium farmers is a difference between Sapuyes and the other analysed municipalities. This can be due to the existence of medium and big potatoes producers. As the Mayor pointed out, potatoes production requires farmers acquiring debt because of the high costs of inputs and the variability of price. The average size of credits for small farmers in Sapuyes is 6,5 million COP, whereas for medium ones it is 44,4 million and for big 215 million. The large share of credits granted to medium farmers is associated with a larger share of private credit provision (21% vs. less than 10% in the other studied

municipalities). The two analysts of local private banks interviewed agreed that credits in Sapuyes are big and good (better than in Guaitarilla), as it is "livestock land" and "very good land". Also, because there is no public bank in Sapuyes, farmers have to go to Tuquerres, where they find both public and private banks. It is interesting to note that no credits were granted by financial cooperatives (at least with Finagro resources), and that there is a lot of microcredit and informal group lending schemes.

The manager of the public bank mentioned that climate shocks have affected the region, but not that often, and that anyway farmers have other alternatives and in general are good repaying. This contrasts with the view of the Mayor, who argued that "the truth is that people are now scared of credits. People have gotten behind in their quotas; some have lost their houses". I did not gather first hand evidence of this, however.

#### GUADALUPE, SANTANDER

Guadalupe is a small municipality located in the south of Santander, in the north-eastern Andean region of Colombia. It has a population of 5.000, covering an area equivalent to 0.5% of the Department's area. The total population in Guadalupe has decreased by 40% since 1985, partly because of scarce economic opportunities. Indeed, 61% of the rural population and 35% of the urban population are poor under Unsatisfied Basic Needs. Although the coverage of education is higher than the regional average, 15% of the population is illiterate and 27% have no education. Furthermore, only 22% of rural inhabitants have access to water services and there is a large housing deficit.

Guadalupe is a rural municipality, almost 70% of its population lives in the rural areas, mainly producing coffee and livestock. Other products include cacao, sugar cane, yuca and fruits. Despite agriculture being a main economic activity, the participation of agriculture in the GDP is low (14%), while industry is 52%. The current local government recognizes the relevance of the agricultural sector but assigns scarce resources to it: while 42% of investment resources go to health, only 2% go to agriculture. Investment increased between 2011 and 2014 due to a surge in national transfers, which account for 83% of public income.

Tourism has recently become an important economic activity in the municipality. There are a couple of nice small hostels visited mainly by Europeans. Ecotourists are attracted by the landscape of enormous mountains and by a nearby river with unique rock formations and coloured plants. It also attracts religious tourists who visit the beautiful restored church. Despite the increasing touristic activity, Guadalupe is a calmed municipality. The armed conflict did not affect it strongly, although it led to internal displacement between 1999 and 2009.

The number of credits per capita is significantly higher than the country's average, and during the period of study, almost 3.000 credits were granted (twice as much than in Betulia, which has a similar population). An agronomist who works in Guadalupe says that it is an area with good credit perspectives, as it is close to Bogota, there are no public order problems and most people own their land. Indeed, the informality rate of land in Guadalupe is starkly low: 2% compared to 20% at the national level. The main financial actor is the public bank, which granted 91% of the credits, of which 93% were directed towards small farmers (94% of farmers are small). Credit directed towards medium farmers remained relatively constant during these years, whereas annual credits granted to small farmers increased 543% between 2002 and 2009, compared to an increase of

98% at the national level. Credit provision in Guadalupe has decreased since then. It seems that this results from the director of the public bank being preoccupied with over-indebtedness, what has made credit allocation stricter (farmers complained about this). Changes in credit dynamics do not appear to be explained by changes in RPO creation. There were no RPOs created during the first boom of credit (2004-2005), and annual RPO creation remained stable between 2005 and 2015.

#### GUAITARILLA, NARIÑO

Guaitarilla is located 72 km south of Pasto (the department capital), at 2.653 meters above the sea level, in the middle of the Andes mountains. Its population is 12.011, of which 69% is rural, although the rural population has decreased 25% in the last 10 years. Guaitarilla is a peaceful municipality, although there is some coca cultivation and in the early 2000 there was guerrilla presence (ELN and FARC) as well as paramilitaries, what generated internal displacement, though not as high as in other areas of the Department.

Guaitarilla has higher poverty levels than the other analysed municipalities, being 54,2 by UBN. However, the town seems to be growing, and there are a couple of large social infrastructure projects that show its progress. Access to public services has improved during the last years, for example, 80% of rural household have access to water, although only 2% have access to sewage systems and the qualitative housing deficit is 47%.

Most of the commerce in the municipality is related with agriculture, and takes place with Pasto and two large nearby municipalities, Tuquerres and Ipiales. There is a large farmer's market on Sundays, when traditional trucks come from different areas of the municipality filled with people, animals and agricultural products. The agricultural GDP is 50% of the total GDP. The municipality has different topographic conditions. In the high areas, there is wheat, beans, potatoes, maize and milk production. In the lower areas, there is coffee, panela and some new crops like greenhouse tomatoes and an exotic fruit called granadilla, which is already being exported to Europe. 99% of farmers in Guaitarilla are small and cultivate for their own consumption as well as for commercializing. As in the other municipalities, the agricultural production faces several obstacles, one of which is deforestation which has generated erosion and water scarcity.

The number of credits granted per capita is significantly higher than average. Almost 8.000 credits were granted during the study period, of which 99% were granted to small farmers, by the public bank, which is the only bank in the municipality. Farmers have to go to Tuquerres to request from other sources. There is a culture of credit in the municipality, as a former credit analyst from the public bank said that "they are indebt all the time". He added that "the portfolio is also high. Credit was granted to everyone, he who arrived, have your credit". This can relate to access to credit being easy, as many farmers own their land. Indeed, the informality rate is very low, only 3,2%. The number of formal credits allocated has decreased since 2012. According to analysts, because of the arrival of competition from microfinance institutions and credit cooperatives, knowing that Guaitarilla is a good place to grant credit, as people are good payers.

The number of RPOs per capita is slightly higher than the national average, but the share of farmers that report being members of RPOs is 11%, the same as the national average. 39 RPOs were created during the study period, 15 of which were created in 2014. This relate to the Agrarian riot of 2013, and to the arrival of a special technical assistance program which encouraged producers to organize. It is also explained by the engagement

of the current and former governments in supporting RPOs. The Secretary of Agriculture said he helps farmers to constitute the RPO, and they subsidize the annual fee to renovate the RPO register, he also helps them in preparing tax reports and structuring projects, giving them financial resources as well. Since 2012, collective action has increased, while agricultural credit has decreased, evidencing the low fit of the econometric model in this off-the-line municipality.

### c. List of Interviews

**Table 3.A1 List of Interviews in order of occurrence**

Person	Location	Type of stakeholder	Month (2017)
Maria Clara Hoyos	Bogotá	Policy expert	September
Lucy Niño	Bogotá	Policy expert	September
Johnathan Diaz	Betulia	Local policy expert	October
Sergio Diaz	Betulia	Local policy expert	October
Carmen Prado	Betulia	RPO member	October
Graciliano Zapata	Betulia	RPO member	October
Alexandra León	Betulia	RPO member	October
Padre Camilo	Betulia	Priest	October
Robinson Maestre	Betulia	Bank analyst	October
Luis Alberto Díaz	Betulia	RPO member	October
Felix Rivero	Betulia	Bank analyst	October
John Calderón	Betulia	Bank analyst	October
Antonio Torres	Betulia	RPO member	October
Vicente Mora	Betulia	RPO member	October
Daisy Maribel	Betulia	RPO member	October
Edgar Lizarazo	Betulia	RPO member	October
Angel David	Guadalupe	RPO member	October
Jaime Angulo	Guadalupe	RPO member	October
Freddy Franco	Guadalupe	Local policy expert	October
Alirio Suarez	Guadalupe	Bank analyst	October
Mayor	Guadalupe	Local policy expert	October
Gilma Suarez	Guadalupe	RPO member	October
Maria Eugenia Diaz	Guadalupe	RPO member	October
Neyla Gomez	Guadalupe	RPO member	October
Edberto Pinilla	Guadalupe	Bank analyst	October
Alex	Guadalupe	Bank analyst	October
Padre José	Guadalupe	Priest	October
Lizeth	Guadalupe	Bank analyst	October

Wilson	Sapuyes	Local policy expert	November
Melba	Sapuyes	Local policy expert	November
Alicia Menayo	Sapuyes	RPO member	November
Rosalba Roando	Sapuyes	RPO member	November
Monica Riascos	Sapuyes	RPO member	November
Alcalde	Sapuyes	Local policy expert	November
Andrés	Sapuyes	Non-member	November
Padre Edgar	Sapuyes	Priest	November
Bernardo	Sapuyes	RPO member	November
Vicente Argan	Sapuyes	RPO member	November
Artemio Argan	Sapuyes	RPO member	November
Henry Salas	Sapuyes	Bank analyst	November
Jorge Luis Erazo	Sapuyes	Bank analyst	November
Carlos	Sapuyes	Bank analyst	November
Cristina Benavides	Guaitarilla	Bank analyst	November
Gabriel	Guaitarilla	Local policy expert	November
Zully Vallejo	Guaitarilla	Bank analyst	November
Padre William	Guaitarilla	Priest	November
Marco Aurelio	Guaitarilla	RPO member	November
Bernardo Pantoja	Guaitarilla	Non-member	November
Jose Burbano	Guaitarilla	RPO member	November
Alex Suárez	Guaitarilla	RPO member	November
Estela	Guaitarilla	RPO member	November
Luis Rosero	Guaitarilla	RPO member	November
Dario Chamorro	Guaitarilla	RPO member	November

#### d. RPO characteristics

**Table 3.A2 RPO characteristics**

Municipality	RPO	Age (years)	Number of Members	Type of RPO	Reasons for creating/joining RPO	Level of CA	Rules	Meeting frequency
<b>Betulia</b>	Asocopa	12	14 (only 5 really active; a couple from another municipality)	Joint Production and used to commercialize	Access public programs	Medium	Initial contribution and monthly quota	On demand
	Aprob	26	100	Sells inputs, grants credit, provides TA	Access public programs, represent tomato producers. Impulse from religious organization	High	Affiliation quota of 5.000 monthly quota of 2.500 Board is named every two years by vote	Board once a month. General Assembly once a year
	Asovenplaya	8	29 (26 women)	Commercialize, apply to projects	Access public programs and training	High	Decisions taken democratically by vote. Monthly quota of 5.000 COP	Once a month
	Asoperiso	8	65	Representation	Represent their interests and raise voice to demand support	Medium	Decisions taken democratically by vote.	Once a month
<b>Guadalupe</b>	Asoprocagua	6	18 members but only 8 are really active	Apply to projects	Commercialize and access public programs. Impulse from SENA	Low	Only active members (have paid quota and go to meetings can profit from projects)	Not often
	Amar	17	25 (women) but only 12 are really active. different areas of the municipality	Apply to projects	Help household economically, learn, friendship	Low	Annual quota of 15.000 COP and affiliation quota of 15.000 COP. Only active members (have paid quota and	Every two months, although not always

							go to meetings can profit from projects)	
<b>Sapuyes</b>	El Bosque	2	24 (22 women)	Joint production and joint commercialization	Access public programs. Impulse from SENA and social leader in Paro Agrario	High	Contribute by working settled shifts. Reinvest income from commercialization  Decisions are taken democratically by vote	When they finish selling a determined quantity
	Prolesa	8	42	Individual production and commercialization	Commercialize, access public program, face challenges of free trade.	High	Each member has contributed around 2 million COP. Keep 50 cents per litre to pay workers of RPO	Once a month
<b>Guaitarilla</b>	Tomate Guaitarilla	7	32 (plus 32 new members of a joint RPO in a neighbouring municipality)	Individual production and joint commercialization	Commercialize in larger quantities. Accessing public programs is secondary.	High	Monthly quota of 5.000. Each member has invested over 2 million. Decisions taken democratically by vote.	At least once a month. 20.000 fine for not assisting.
	El Sol	3	28	Individual production and credit provision. Apply to projects	To access public programs, commercialize jointly, offer credit to members and protest against the government	Low	Monthly contribution of 10.000 for credit fund.	Once a month



